

LOCAL DROUGHT RESPONSE INFORMATION

Western Drought Coordination Council
Preparedness and Mitigation Working Group

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This information was developed by the Preparedness and Mitigation Working Group of the Western Drought Coordination Council to help municipal water suppliers compare different approaches to drought planning. Drought can occur anywhere, and at any time, so it's a good idea for municipal water suppliers to plan for droughts of various duration and severity.

The Working Group collected drought response plans from municipalities around the country. Two of the most common elements of a drought contingency plan are identifying triggers that initiate special management actions (usually demand reduction), and identifying specific response actions.

This document is considered a work in progress and will continue to evolve as new information is received. Additional Drought Contingency Plans are sought and will be included when they provide new or different examples of triggers and/or responses, that may be of value to others.

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LOCAL DROUGHT RESPONSE INFORMATION

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Seattle, WA

Santa Barbara, CA

Drought Plan Extract

Corpus Christi, TX

Denver, CO

New York, NY

Local entities in KY

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St. Johns River Water Management

District, FL

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Millbrae, CA

Phoenix, AZ

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Santa Barbara, CA

LOCAL DROUGHT RESPONSE INFORMATION

Drought can occur anywhere and anytime, so it's wise to plan for droughts of various length and duration. Two of the most common elements of a drought contingency plan are identifying triggers that initiate special management actions (usually demand reduction), and identifying specific response actions.

Table 1, Local Drought Response Information, summarizes information on how a few of the agencies across the country have addressed these elements.

Selecting which agencies to include were based on several factors: a range of populations being served, a distribution of climatic setting, a variety of examples of sources of supply, some unique issues being addressed (such as specifically defining essential and non-essential uses of water, issues of revenue protection, or service termination), and examples of different ways of addressing common issues (such as golf courses, commercial nurseries, swimming pools, and public information programs).

As a matter of coincidence, these examples also demonstrate a range of writing styles (ranging from legal and bureaucratic to what might be called conversational).

The selections presented are not meant to indicate that they are "the best" or even that they have worked well. They show various issues and approaches.

If you would like to see an agency's complete drought response plan, please contact that agency.

DROUGHT INDICES AND TRIGGERS

Using an index to gauge the severity of drought and to initiate and terminate responses is a well established practice. When the index value is used solely to discuss droughts, it is usually called an index; when used as an administrative action indicator, the term trigger is generally used; and when used for both, the terms become inter-changeable.

There are several general considerations in deciding whether to apply a specific index or trigger in a particular situation: Is the index available? Can it be calculated quickly, or does it only come out two weeks or a month after all data are gathered? Is it reliable? Can it be meaningfully correlated with actual conditions?

For large geographic areas (ranging from continental, to multi-state, to sub-state areas) there are at least eight recognized indices. The indices each use a limited number of basic raw data: precipitation; snow-pack; temperature; soil moisture; and/or reservoir storage. Indices provide a way to compare present conditions with the historic record and present a relative magnitude of the drought condition.

The most commonly available indices are discussed in depth on the National Drought Mitigation Center's web site.

Percent of Normal Precipitation

Deciles

Palmer Drought Severity Index

Surface Water Supply Index

Standardized Precipitation Index

Crop Moisture Index

Rainfall Index

Dependable Rain

At the local water utility level, these indices are supplemented or replaced with more localized information. The local indices may be as simple as a flow measurement at the point of diversion on a river, the depth of the aquifer, the projected reservoir storage at some point in the future, a notification from the water supplier of potential or actual decreases in delivery, or the ratio of potential demand to potential supplies.

RESPONSES

Responses to drought conditions, regardless of the statistical data used to define the drought, are usually progressive in nature, increasing as the drought extends over time or becomes more severe in terms of reduced water supplies.

There are three conditions that are almost universally recognized as being necessary to achieve water use reductions during the earliest stages of drought: the public must recognize the potential severity of drought's impacts; the public must see the requested actions as affecting supply and demand; and the requested actions must be equitable. Clear, consistent, and credible communication is critical.

Without exception, the goal of every water utility drought response plan is to preserve an adequate water supply to protect public health and safety, regardless of the severity or length of the drought. To achieve this goal, utilities arrive at various levels of drought response stages based on the anticipated water supplies and the water use requirements of the community.

One example (Corpus Christi, TX) of how priority of use is defined is the following: "In making decisions under this plan concerning the allocation of water between conflicting interests, highest priority will be given to allocation necessary to support human life and health; i.e. the minimum amount of water necessary for drinking, prevention of disease, fire prevention, and the like. Second highest priority will be given to allocations which will result in the least loss of employment to persons whose income is essential to their families."

The following (from the Kentucky Water Shortage Response Plan) is a good example of how utilities use voluntary reductions and mandatory restrictions for different levels of drought. The utility has established four levels or stages of drought, each progressively more severe, in terms of reduced water supplies. The utility has defined all water use as either essential, socially or economically important, or non-essential. The utility has also defined which actions will be voluntary (V) and mandatory (M).

<u>Water Use Class</u>	<u>Recommended Conservation Response For Each Drought Stage</u>			
	<u>Advisory</u>	<u>Alert</u>	<u>Emergency</u>	<u>Rationing</u>
Essential	V	V	V	M
Social or Economically Important	V	V	M	M
Non-Essential	V	M	M	M

In the above example, essential water use was defined in three categories. Domestic use includes water necessary to sustain human life and the lives of domestic pets and to maintain minimum standards of hygiene and sanitation. Health Care Facility use includes water necessary for patient care and rehabilitation. Public use is the water necessary for firefighting, and health and public protection purposes, if specifically approved by health officials and the municipal governing body.

Understanding the relative magnitude of water use by the various water using sectors (residential, industrial, commercial, institutional, and agricultural) and their relative importance to the local economy is extremely important in establishing water use reduction targets for the various stages of drought events. The following illustrates how one utility (Charleston, SC) targets these various water using sectors.

<u>Drought Stage</u>	<u>Water Reduction Goals</u>
Moderate	Reduction of 20% in residential use, 10% in all other uses, and 15% in overall use.
Severe	Reduction of 20% in residential use, 15% in all other uses, and 20% in overall use.
Extreme	Reduction of 30% in residential use, 15% in all other uses, and 25% in overall use.

Another utility (Millbrae, CA) targeted its reductions for various sectors in the following manner:

Stage	Residential	Commerical/ Government	Irrigation	Total
I	5%	5%	5%	5%
II	10%	5%	10%	9%
III	15%	5%	20%	13%
IV	19%	5%	60%	18%
V	45%	35%	90%	46%

There are as many variations of response actions as there are entities with drought response plans. The very act of developing a drought contingency plan is in and of itself a response activity focused on the next drought. Devising a drought plan with full public input starts the communication cycle that will be necessary later on. Identifying the appropriate statistical index and tying specific actions to those trigger values is extremely important. It's also important to involve senior water management officials.

TABLE 1. LOCAL DROUGHT RESPONSE INFORMATION
(See attached pages for more detailed information for each entity)

ENTITY	STATISTICAL INDICES	LEVEL OR STAGE and RESPONSE ACTION
Corpus Christi, Texas	Combined reservoir storage is estimated to be 40% of total storage capacity	Shortage Possibility: Public information actions; requests voluntary conservation by all users; limit use for irrigation of vegetation; mandatory conservation by municipal operations; odd/even address yard watering; investigate alternative sources.
	Combined reservoir supply is less than 40% but greater than 30%, and City Manager directs implementation to protect reservoir storage levels	Shortage Watch: Above actions plus: some outdoor use restrictions; increase public information activities.
	Combined water supply is estimated to be less than 100,000 acre-feet	Shortage Warning: All of the above plus: prohibit some new water connections; mandatory reductions by industrial and commercial; limit residential use without rate penalty.
	Water supply is estimated to be less than 65,000 acre-feet	Shortage Emergency: All of the above plus: prohibit all new connections; allocate water to industry; establish monthly residential use; ration water through trucks.

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Denver, Colorado	If predicted or actual July 1 storage is below 80% full	Mild Drought: Target Use Reduction: 10%. Initiate public information program; seek voluntary outdoor use reductions; discourage changes in or establishing new landscapes; consider rate increase to recover lost revenues.
	If predicted or actual July 1 storage is below 60% full	Moderate Drought: Target Use Reduction: 30%. All above actions plus: seek voluntary limit or elimination of non-essential use; restrict outdoor use; prohibit planting of new lawns; increase rates; require audits for high-volume users.
	If predicted or actual July 1 storage is below 40% full	Severe Drought: Target Use Reduction: 50%. All of the above plus: prohibit outdoor use except for subsistence of trees and shrubs; prohibit all new landscaping; increase penalties for wasting water; increase rates; impose moratorium on new taps.

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New York City, New York	Less than 50% possibility that the major components of the reservoir system (Catskill or Delaware) will fill by June 1.	Drought Watch: Initiate awareness programs; maximize use from Croton system; expand leak detection and repair; increase hydrant surveillance; seek voluntary use reduction by outside communities.
	Less than 33% possibility that either Catskill or Delaware system will fill by June 1.	Drought Warning: All of above plus: implement conservation actions by City agencies; enforce required use restrictions by outside communities; shut off services to vacant buildings; suspend or restrict some non-essential uses.
	When it becomes necessary to assure that the City's reservoirs will not be drained.	Drought Emergency: All of the above plus: prohibit or reduce water use for: car washing; ornamental water use; water golf courses; seek commercial and industrial reduction staged for 15%, 20% and 25%; lawn, ornamental shrub or plant watering. Restrictions applied in 3 progressive phases.

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ENTITY	STATISTICAL INDICES	LEVEL OR STAGE and RESPONSE ACTION
Local Entities, Kentucky	<p>Wells: when supply conditions are especially low, or when another well is showing signs of reduced supply, or when static water level is decreasing faster than usual or when draw down is increasing faster than historically normal for the season</p> <p>Streams and Springs: for free-flowing streams and springs when demand is 20-40% of flow; for flow-regulated streams, when levels are low in the reservoir behind the regulating dam or when demand is 50-65% of flow</p> <p>Reservoirs and Impoundments: when there are less than 60 but more than 45 supply days left</p>	<p>Water Shortage Advisory: Conservation (use reduction) response for water use classified as:</p> <p>Essential - Voluntary (domestic use to sustain human life and domestic pets; health care facilities; firefighting; health and public protection)</p> <p>Socially or Economically Important - Voluntary (home use for kitchen, bathroom, laundry; production of food, fiber or maintenance of livestock; commercial nurseries at a level to maintain stock; arboretums, etc., necessary to preserve specimens; residential swimming pools serving more than 25 dwelling and municipal pools; restaurants; laundromats)</p> <p>Non-essential - Voluntary</p>
	<p>Wells: shortage in a well would be abnormally large or rapid increase in drawdown or a large decrease in static water level</p> <p>Streams and Springs: for free-flowing streams and springs when demand is 40-65% of flow, for flow-regulated streams when dam releases are cut back or when demand is 65-75% of flow</p> <p>Reservoirs and Impoundments: when there are less than 45 but more than 21 days available supply</p>	<p>Water Shortage Alert: Conservation (use reduction) response for water use classified as:</p> <p>Essential - Voluntary Socially or Economically Important - Voluntary Non-essential - Mandatory</p>
	<p>Wells: when significant changes in drawdown or static water levels exist</p> <p>Streams and Springs: for free-flowing streams and springs when demand is 65-75% of flow, for flow-regulated streams when dam releases are greatly diminished or when demand is more than 75% of flow</p> <p>Reservoirs and Impoundments: when there are less than 21 but more than 14 days available supply</p>	<p>Water Shortage Emergency: Conservation (use reduction) response for water use classified as:</p> <p>Essential - Voluntary Socially or Economically Important - Mandatory Non-essential - Mandatory</p>

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ENTITY	STATISTICAL INDICES	LEVEL OR STAGE and RESPONSE ACTION
Local Entities, Kentucky (continued)	<p>Wells: when supply appears to be running out</p> <p>Streams and Springs: when demand is 75% or more than flow, on flow-regulated streams, depends on operational characteristics of the upstream reservoir</p> <p>Reservoirs and Impoundments: when less than 14 days of supply is available</p>	<p>Water Shortage Rationing: Conservation (use reduction) response for water use classified as:</p> <p>Essential - Mandatory</p> <p>Socially or Economically Important - Mandatory</p> <p>Non-essential - Mandatory</p>

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Charleston, South Carolina	When the Palmer Index reaches the -1.50 to -2.99 range and drought conditions have been verified by best available information and this situation is expected to persist	Moderate Drought Goal: reduction of 20% in residential use, 10% in all other uses, and 15% in overall use. Voluntary reductions in use for all purposes and voluntary reductions in use during peak demand periods.
	When the Palmer Index reaches the -3.00 to -3.99 range and drought conditions have been verified by best available information	Severe Drought Goal: reduction of 25% in residential use, 15% in all other uses, and 20% in overall use. All of the above plus: voluntary reductions changed to mandatory restrictions for non-essential use (uses not needed to satisfy public health and safety requirements); limit landscape watering; place moratorium on additional landscape irrigation; impose penalties for violations of mandatory restrictions.
	When the Palmer Index reaches or falls below -4.00 and drought conditions are verified by best available information	Extreme Drought Goal: reduction of 30% in residential use, 10% in all other uses, and 25% in overall use. All of the above plus: moratorium on new connections; consider surcharge on use above 80% of residential average usage.

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St. Johns River Water Management District, Florida	Anticipated reduction in overall demand of 15% is required to reduce estimated present and anticipated demand to equal present and anticipated available water supply to protect the water resource from serious harm	Moderate Water Shortage Seek voluntary reduction of domestic use to 60 gallons per person per day. Institute voluntary conservation measures; seek voluntary reductions in use by agriculture and aquacultural uses; restrict or seek voluntary reductions for nursery, landscape, recreation uses; seek voluntary reductions or place restrictions on other uses.
	Anticipated reduction in overall demand of 30% is required to reduce estimated present and anticipated demand to equal present and anticipated available water supply or protect the water resource from serious harm	Severe Water Shortage Same as above plus: seek voluntary reduction of domestic use to 50 gallons per person per day; change some voluntary actions to restricted uses.
	Anticipated reduction in overall demand of 45% is required to reduce estimated present and anticipated demand to equal present and anticipated available water supply or protect the water resource from serious harm	Extreme Water Shortage Same as above plus: seek voluntary reduction of domestic use to 40 gallons per person per day; change some voluntary actions to restricted uses.
	Anticipated reduction in overall demand of 60% is required to reduce estimated present and anticipated demand to equal present and anticipated available water supply or protect the water resource from serious harm	Critical Water Shortage Same as above plus: seek voluntary reduction of domestic use to 40 gallons per person per day; change some voluntary actions to restricted uses.

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Des Moines, Iowa	When flows are less than 200 CFS at SE 14th St. Bridge, request release of storage water. When water has been released from storage and there is an indication that without wise usage of water, a shortage could occur	Stage I: Seek voluntary domestic water use reductions; request minimal Municipal water usage.
	After 30 days or less, if the maximum day water conservation (under Stage I) has not been reduced by 10%, and there is still an indication that a water shortage could occur	Stage II: Continuation of Stage I and: request odd-even water days; request public agencies conserve usage.
	After 30 days or less, if the maximum day water consumption (under Stage II) has not been reduced by 30% and there is still an indication that a water shortage could occur	Stage III: Mandatory discontinuance of outdoor water usage; implement water shortage rate structure
	After 30 days or less, if the maximum day water consumption (under Stage III) has not been reduced by 30% and there is still an indication that a water shortage could occur	Stage IV: Impose consumption reduction of 30% for all residential usages and (90% for commercial and industrial uses); the use of water may be suspended or restricted in the following order: a) for recreational or aesthetic purposes (if not already restricted under Stage III); b) for all irrigation purposes; c) for manufacturing or other industrial processes; d) for the generation of electrical power for public consumption; e) for livestock production.

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Millbrae, California	Ongoing. Supply Shortage: 0 - 5%	Stage I Goal: Voluntarily reduce water waste and increase use efficiency by: using the Memorandum of Understanding Regarding Urban Water Use in California; inform users of their historic use; encourage minimum municipal use; repair leaks within 10 days; analyze water rate structure.
	Supply from San Francisco Water Department (SFWD) is 90 - 95% of normal for next year based on snowpack measurements and projected runoff	Stage II Goal: 10% voluntary reduction by: continuing all Stage I elements; request voluntary 10% conservation; enhance public information campaign; implement non-essential use restrictions on a voluntary basis.
	Supply from SFWD is 80 - 90% of normal based on snowpack measurements and runoff projects for next year	Stage III Goal: 20% voluntary reduction by: continuing all Stage II elements; increase water saving devices giveaway program; add additional non-essential voluntary use restrictions; notify customers of water waste.
	Supply from SFWD is 65 - 80% of normal based on snowpack measurements and runoff projects for next year	Stage IV Goal: 25% mandatory rationing by: continuing all Stage III elements; change voluntary use restrictions to mandatory; add additional mandatory non-essential use restrictions.
	Supply from SFWD is 50 - 65% of normal based on snowpack measurements and runoff projects for next year	Stage V Goal: 45% mandatory rationing by: continuing all Stage IV elements; increase rationing levels, add additional non-essential mandatory use restrictions; enhance public information.

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Phoenix, Arizona	When informed of impending cutback in water deliveries	Water Alert: Extensive public education to motivate voluntary water conservation, mandatory implementation of In-City Drought Plans, Stage 1 and enforcement of existing codes.
	When deliveries are actually reduced	Water Warning: Accelerated public education, limited outdoor water use restrictions or bans and assessment of a 15% drought surcharge on water rates as a low-impact rationing scheme.
	When notified of additional reductions in deliveries which cannot be compensated for by a redistribution of available supplies	Water Emergency: Mandatory conservation measures would be imposed and the drought surcharge on water rates would be increased to 30%.
	When Water Emergency supplies and conservation programs are insufficient to meet water demands	Water Crisis: The drought surcharge on water rates would be adjusted to reduce demands to match available supplies.

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Seattle, Washington	<p>Total reservoir storage is not projected to be at standard operating capacity as of June 1, due to exceptionally low snow pack, precipitation and/or lack of carryover storage from previous year</p> <p>Total reservoir storage and predicted inflows are significantly below historical “normals” for the current time of year, and supply modeling indicates that expected demands may not be met if this trend continues or worsens</p>	Advisory Stage: Brief Officials, increase media education on water systems. Provide up to date data and implications for water use.
	<p>Supply conditions identified in the Advisory Stage have not improved</p> <p>Demand levels indicate that a more systematic response to managing the situation is called for</p>	Voluntary Stage: All of the above plus: maintain or reduce demand to meet target consumption levels by customer voluntary actions.
	When it is determined that measures undertaken in the voluntary Stage are not adequately reducing demand to the targeted level and, that progressing to mandatory restrictions is necessary to forestall the potential for a serious water shortage	Mandatory Stage: All of the above plus: mandatory reductions in water use.
	Recognition that a critical water situation exists. Without significant curtailment actions, a shortage of water for public health and safety will be imminent	Rationing Stage: All of the above plus: define the problem to the public as an emergency and institute formal procedures to declare a city emergency.

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Santa Barbara, California	The water supply for the current or impending water year is approximately 10% less than projected demand	Drought Watch: Publicized declaration of Drought Watch and provides media and public with information regarding status of water supply. City facilities directed to make a 10% reduction in water use.
	Water supply for the current or impending water year is approximately 15% less than projected demand	Drought Alert: All of the above plus: irrigation reduced, ornamental fountains turned off, reduced cleaning of City vehicles and facilities, reducing flushing of streets, sewers, and storm drains. Restricted use of fire hydrants. 15% reduction in water use at City facilities.
	Water supply for the current or impending water year is 20%, or more, below projected demand; or, that the ordinary demands and requirements of water customers cannot be satisfied without depleting the water supply to the extent that there would be insufficient water for human consumption, sanitation, and fire protection	Drought Emergency: All of the above plus: public and media informed of water supply status. City facilities directed to make an immediate 20% reduction in water use.

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Corpus Christi, Texas
(Extracts from Drought Contingency Plan)

Water Shortage Possibility (Combined water stored in the reservoirs is estimated to be 40% of total storage capacity.)

1. Daily monitor lake levels.
2. Check operation of city-owned or leased wells for operational problems.
3. Discuss water conservation and rationing possibilities with City's wholesale customers.
4. Discuss water conservation and rationing possibilities with other water rights holders.
5. Discuss possibility of a water conservation and rationing program with large water volume industrial users.
6. City Council declares shortage condition exists and implements drought contingency plan.
7. Request voluntary conservation of water by all users. Mandatory conservation by municipal operations. Odd/even address yard watering.
8. Investigate alternative water sources (inventory existing and shut-in wells, use of wastewater plant effluent, cloud seeding, importation, desalination, other).
9. Water leak reduction program, leak repairs have highest priority.

Restrictions imposed on use of water for irrigation of vegetation:

Water for irrigation of vegetation may be used only on such day or days of each week, other than between the hours of 10:00 a.m. and 6:00 p.m., based on street numbers. However, the following exemptions may be requested:

- For the establishment and maintenance of flower gardens, vegetable gardens, fruit gardens, trees, and shrubs, or plants in containers, and applied using: hand held hose equipped with a positive shutoff nozzle; drip system equipped with an automatic shutoff device; soaker hose equipped with an automatic shutoff device; root feeder equipped with an automatic shutoff device; or a hand held bucket or watering can.
- At any hour, at a minimum rate necessary, for the establishment and maintenance of commercial nursery stock and using: a hand held hose equipped with a positive shutoff nozzle; a sprinkler system; a drip irrigation system equipped with an automatic shutoff device; a soaker hose, equipped with an automatic shutoff device; a root feeder equipped with an automatic shutoff device; a hand held bucket or watering can.
- For irrigation, at the minimum rate necessary, for the establishment of newly planted lawns and planted material within 30 days of planting. Water used for this purpose may be applied by any means.
- Wastewater treatment plant effluent, gray water, well water (which is not mixed with any water from the City's water supply) or other water not obtained from the City's water system may be used at any hour, with a permit, and with a sign posted saying where the water comes from.
- For irrigation, at the minimum rate necessary, for the maintenance of golf course greens and tee boxes.
- At any hour for short periods of time for testing related to the installation, maintenance and repair of sprinkler systems.
- For irrigation of vegetation on a large parcel of land or unique botanical institution, in conformance with a special watering plan, approved by the City.

Water Shortage Watch (Combined water supply in reservoirs is less than 40% but greater than 30% of total storage capacity and the City Manager directs implementation in order to protect reservoir storage levels.)

10. Restrict use for outdoor uses such as car washing, dust control, exterior building, sidewalk, and driveway washing.
11. Restrict use of fire hydrants for any use other than fire fighting.
12. Establish committee of governmental, health, industrial, and private citizens to review policies and issue exemptions.
13. Meet with industrial and commercial users to determine allocations.
14. Review Water and Wastewater Division budgets.

The sprinkling or watering of vegetation is prohibited, however, the City Manager may authorize watering of vegetation as follows:

- The watering of trees; shrubbery; annual, biennial or perennial plants; vines; gardens and flowers with potable water may be permitted, at the minimum rate necessary for the maintenance of plants, through the means of a hand held hose equipped with a positive shutoff nozzle, a drip irrigation system, a root feeder equipped with an automatic shutoff device, a soaker hose equipped with an automatic shutoff device, a hand held bucket or watering can or a sprinkler system which is either attended throughout its use or equipped with automatic shutoff . When authorized, day and time restrictions will apply.
- Watering of lawns with potable water may be permitted once every other week on the watering days designated by the City Manager, based on the street number, except between the hours of 10:00 a.m. and 6:00 p.m. through the means of a hand held hose equipped with a positive shutoff nozzle, a drip irrigation system, a hand held bucket or watering can, or a sprinkler system which is either attended throughout its use or is equipped with an automatic shutoff.
- Commercial nurseries shall be permitted to water nursery stock with potable water, at a minimum rate necessary to establish and maintain commercial nursery stock, by means of a hand held hose equipped with a positive shutoff nozzle, a drip irrigation system, a root feeder equipped with an automatic shutoff device, a soaker hose equipped with an automatic shutoff device, a hand held bucket or watering can, or a sprinkler system which is attended throughout its use, is equipped with an automatic shutoff device or recaptures and recirculates irrigation water.
- Allowing of water to run off yards or plants into gutters or streets shall be deemed a waste of water and is prohibited.
- The washing of automobiles, trucks, trailers, boats, airplanes and any other type of mobile equipment is prohibited except that individuals and filling stations may wash cars and boats if they use a bucket, pail, or other receptacles not larger than of 5 gallon capacity; however, an individual or filling station, before or after such washing, shall be permitted to rinse the car or boat off with a hose using only a reasonable amount of water in so doing. Commercial or automatic car wash establishments shall use minimum practical water settings.
- The washing of building exteriors and interiors, trailers, trailer houses and railroad cars with potable water is prohibited, except by a professional power washing contractor or that in the interest of public health the Director of Public Health may permit limited use of the water as the case may be, including allowing the use of water for the removal of graffiti.
- The permitting or maintaining of defective plumbing in a home, business establishment or any location where water is used on the premises. The permitting of the wasting of any water by reason of defective plumbing shall include the existence of out-of-repair water closets, under

- ground leaks, defective faucets and taps. The permitting of water to flow constantly through a tap, hydrant, valve or otherwise by any user of water connected to the City system, shall be considered as a waste of water and prohibited by this plan.
- The use of fire hydrants for any purpose other than fire fighting is prohibited, except the City Manager may permit the use of metered fire hydrant water by the city or commercial operators using jet rodding equipment to clear and clean sanitary and storm sewers.
- The use of potable water in ornamental fountains or in artificial waterfalls is prohibited where the water is not reused or recirculated in any manner.
- The use of potable water to wash down sidewalks, walkways, driveways, parking lots, tennis courts, or other hard-surface area, or building or structure, except by a professional power washing contractor, is prohibited.
- The use of potable water for dust control is prohibited.
- The use of potable water by a golf course to irrigate any portion of its grounds is prohibited, except those areas designated as tees and greens may be watered between the hours of 6 a.m. and 10 a.m. on Mondays, Wednesdays, Fridays, and Sundays.
- Any use of water for the purposes or in a manner prohibited in this plan shall be deemed to be a waste of water.
- The City Council shall appoint an Allocation and Review Council for the purpose of reviewing water conservation policies and establishing exemptions.

Water Shortage Warning (Combined water supply in reservoirs is estimated to be less than 100,000 acre-feet.)

15. Prohibit new connections to distribution system where other supply service is available.
16. Mandatory reduction of normal water use by industrial and commercial customers.
17. Limit residential customer use without rate penalty. Review rate schedule to discourage overuse.

The City Manager may implement any or all of the following elements as are deemed necessary at any particular time:

- New service connections to the city's water system are prohibited where some other source independent of the city's water system is existing and in use at the time of passage of this plan.
- A mandatory limit of normal water use by customers without use penalty, in amounts as determined by the City Manager.
- The City Council shall establish a maximum limit beyond which water service will be terminated.
- The use of water to serve a customer in a restaurant, unless requested by the customer, is prohibited.
- The use of water for the expansion of commercial nursery facilities is prohibited.
- The use of water for scenic and recreational ponds and lakes is prohibited.
- The use of water for private, single-family residential swimming pools, wading pools, jacuzzi pools, hot tubs and like or similar uses is prohibited.
- The use of water for municipally-owned swimming pools is prohibited.
- The use of water for privately-owned neighborhood and subdivision swimming pools accessible to the public and swimming pools owned by country clubs, athletic clubs, health clubs, fraternal organizations and other like or similar pools is prohibited.

- The use of water for hotel, motel, condominium, apartment and other multi-family, residential-user swimming pools, including commercial and business swimming pools is prohibited.
- The use of water to put new agricultural land into production is prohibited.
- The use of water for new planting or landscaping is prohibited.

Water Shortage Emergency (Water supply in reservoirs is estimated to be less than 65,000 acre-feet.)

18. Prohibit new connections to City distribution system.
19. Review Water and Wastewater Division budgets.
20. Shut down water treatment plant when water treated is less than 100 million gallons/day.
21. Allocate water to industry.
22. Establish maximum monthly use for residential meters, the amount dependent upon alternative water supply available. Revise rate schedules to discourage overuse.
23. Lock all residential meters, when it appears water supply may become depleted. Ration water through trucks or other isolated sources.
24. The City Council and City Manager to take those actions deemed necessary to meet the conditions resulting from the emergency.

The City Manager may implement any or all of these elements as are deemed necessary at any particular time:

- No applications for new, additional, further expanded, or increase-in-size water service connections, meters, service lines, pipeline extensions, mains, or other water service facilities of any kind shall be allowed, approved, or installed except as approved by the Allocation and Review Committee.
- All allocations of water use to industrial and commercial customers in amounts as established after consultation with the Allocation and Review Committee.
- The maximum monthly use for a residential customer be established with revised rate schedules and penalties by the City Council on recommendation by the Allocation and Review Committee.

OTHER ITEMS:

Priority of use: In making decisions under this plan concerning the allocation of water between conflicting interests, highest priority will be given to allocation necessary to support human life and health; i.e. the minimum amount of water necessary for drinking, prevention of disease, fire prevention, and the like. Second highest priority will be given to allocations which will result in the least loss of employment to persons whose income is essential to their families.

The Allocation and Review Committee: The Allocation and Review Committee shall be composed of 6 members, the Director of Public Utilities, the Director of Public Health, a representative of industry, a representative from business and commerce, a homemaker-citizen, and a citizen of the city. The industry, business, homemaker, and citizen members shall be appointed by the Mayor and Council and shall serve at the pleasure of the City Council.

Surcharges:

Residential water customers:

- \$3.00 for the first 1,000 gallons over allocation
- \$5.00 for the second 1,000 gallons over allocation
- \$10.00 for the third 1,000 gallons over allocation
- \$25.00 for each additional 1,000 gallons over allocation

Allocation to residential customers:

<u>Persons Per Household</u>	<u>Gallons Per Month</u>
1 or 2	6,000
3 or 4	7,000
5 or 6	8,000
7 or 8	9,000
9 or 10	10,000
11 or more	12,000

Nonresidential customers:

The allocation shall be approximately 75 percent of the customer's usage for the corresponding month's billing period for the previous 12 months, provided, if the 75 percent allocation is less than 6,000 gallons, the allocation will be 6,000 gallons.

If the allocation is 6,000 gallons through 20,000 gallons per month:

- \$3.00 per 1,000 for the first 2,000 gallons over allocation
- \$5.00 per 1,000 for the second 2,000 gallons over allocation
- \$10.00 per 1,000 for the third 2,000 gallons over allocation
- \$25.00 per 1,000 for all amounts over 6,000 gallons over allocation

If the allocation is 21,000 gallons per month or more:

- One times the block rate for each 1,000 gallons in excess of the allocation up through 5 percent above allocation.
- Three times the block rate for each 1,000 from 5 percent through 10 percent above allocation.
- Five times the block rate for each 1,000 from 10 percent through 15 percent above allocation.
- Ten times the block rate for each 1,000 gallons more than 15 percent above allocation.

Termination of Service

Water service to the customer may be terminated in the following conditions:

- Monthly residential water usage exceeds allocation by 4,000 gallons or more two or more times (which need not be consecutive months).
- Monthly water usage on a master meter which jointly measures water usage to multiple residential dwelling units exceeds allocation by 4,000 gallons times the number of dwelling units or more, 2 or more times (which need not be consecutive months).
- Monthly nonresidential water usage for a customer whose allocation is 6,000 gallons through 20,000 gallons exceeds it allocation by 7,000 gallons or more, 2 or more times (which need not be consecutive months).

- Monthly nonresidential water usage for a customer whose allocation is 21,000 gallons or more, exceeds its allocation by 15 percent or more, two or more times (which need not be consecutive months).

Denver Water
(Extracts from Drought Response Plan, July 1997)

Mild Drought (Predicted or actual July 1 storage is below 80% full) Target use reduction: 10%

Menu of possible Denver Water Board actions to cut water use:

Initiate campaign to alert public of drought

- Acquaint customers with measures they can expect if drought continues
- Invite public discussion on water use priorities and ways to cut water use
- Publish suggestions for temporarily reducing water use
- Ask customers to voluntarily reduce outdoor water use using their own methods and Denver Water suggestions
- Discourage changes in landscape or establishing new landscape
- Consider a rate increase to recover lost revenues
- Monitor drought response effectiveness daily, recommend adjustments monthly, report to the public regularly, and document results annually

Moderate Drought (Predicted or actual July 1 storage is below 60% full) Target use reduction: 30%

Menu of possible Denver Water Board actions to cut water use:

- Continue all other efforts started in the mild drought stage
- Generate publicity about the Denver Response Hotline: prepare Denver Water personnel - particularly customer service employees - to respond to drought-related questions and give information
- Increase customer information, emphasizing the severity of the drought and need for decisive measures
- Intensify public discussion about water use priorities and ways to cut water use
- Increase efforts to solicit volunteers for audits by Denver Water
- Publish a do-it-yourself audit brochure for households and aggressively promote it
- Encourage customers to voluntarily limit or eliminate non-essential water uses and provide guidelines
- Restrict outdoor water use to specific hours and days
- Prohibit planting new lawns from seed or sod
- Train and assign field and customer service personnel to police outdoor water use, issue warnings, and impose penalties for water waste, for permit violations and for noncompliance with restrictions
- Increase rates to increase financial incentives for reducing water use
- Require audits for high-volume water users in all customer classes, advise them on ways to reduce water use and, where appropriate, provide retrofit devices
- Provide water audits and recommend drought response measures for all large irrigated public areas
- Highlight unusually high use on customers' bills
- Step up Denver Water's ongoing leak detection and repair activities for water pipes and mains under streets
- Monitor drought response effectiveness daily, recommend adjustments monthly, report to the public regularly, and document results annually

Guidelines For Cutting Non-Essential Water Use During Drought Response:

1. Reduce all outside irrigation in proportion to the severity of the drought
2. Reduce or eliminate watering of nursery stock at tree farms
3. Reduce or eliminate car washing on dealers' lots
4. Eliminate curbside car washing by all customers
5. Eliminate washing sidewalks with water hoses
6. Eliminate street cleaning
7. Reduce or eliminate filling private swimming pools
8. Reduce greenhouse water use
9. Reduce park and golf course irrigation
10. Eliminate all fire hydrant uses outside those required for public health and safety
11. Turn off ornamental fountains in buildings and parks
12. Reduce the use of or close public and private swimming pools and other water recreation facilities
13. Reduce or eliminate irrigation of private and community gardens

Severe Drought (Predicted or actual July 1 storage is below 40% full)

Target use reduction: 50%

Menu of possible Denver Water Board actions to cut water use:

- Continue all other efforts started in mild and moderate droughts
- Intensify public information to reinforce the need for extreme measures; generate awareness of drought status, response, policy recommendations, requirements and penalties
- Generate more intense public discussion and media involvement about water use priorities, ways to cut water use while minimizing impacts on landscape and recovery planning
- Prohibit outdoor water use except for subsistence irrigation of trees and shrubs
- Publish information on ways to minimize landscape damage and loss
- Prohibit all new landscaping, including laying of new sod and starting new lawn from seed
- Increase penalties for wasting water, violating permits or ignoring restrictions
- Limit customer service personnel to essential functions and assign customer service representatives to increase enforcement of drought measures
- Increase rates to increase financial incentives for using less water
- Provide information and assistance to customers planning for post-drought landscape revival or replacement; focus public attention on plant and tree species that have weathered drought better than most
- Impose a moratorium on new taps
- Monitor drought response effectiveness daily, recommend adjustments monthly, report to the public regularly, and document results annually

OTHER ITEMS

The Denver Water Citizens' Advisory Committee

The Denver Water Citizens' Advisory Committee (CAC) is a standing nine-member group that monitors the agency, helps increase public awareness, invites public involvement, and advises the Denver Water Board on policies. In the event of a drought, the CAC's Drought Response Task Force would be expanded to further develop and review drought plans. This group will seek even broader participation from the landscaping and plumbing industries and the public-at-large, including low-income customers, Western Slope representatives, the recreation community, businesses, city agencies, and any other interested groups.

Drought Revenue Management

Several factors will affect how much Denver Water customers reduce water use, including the severity of the drought. As less water is available, customers will, of course, start using less water. To the extent that water use is less than normal, there will be a revenue shortfall. Only a minimum amount of Denver Water's annual operations and maintenance costs are variable. Denver Water will have to cover at least the same amount of expenses regardless of the amount of water sold. In fact, it is likely that operations and maintenance expenses will increase to cover costs for enforcement, monitoring and other special factors connected to drought response.

During a Mild Drought, voluntary conservation and public information programs should meet the targeted 10% demand reduction. However, a rate increase may be needed to cover expenses.

During a Moderate Drought, the target demand reduction is 30%. Rate increases will likely be significant at this stage.

During a Severe Drought the target demand reduction is 50%. Rate increases will be substantial to achieve water savings and cover expenses.

The trigger that signals the onset of drought conditions is reservoir storage. Reservoir storage also signals the end of drought. At this point, the restrictions are relaxed or removed, and the public information programs are directed at letting Denver Water's customers know that the drought is over. However, the trigger that signals that rates can be lowered is water use. To the extent that the use reduction programs implemented during the drought are permanent (low flow showerheads and faucets, more Xeriscaped yards, ultra-low-flow toilets, etc.) or customers' habits have been altered, water use may not go back to its pre-drought level. If this is the case, the rates will probably not drop back to their pre-drought levels. It is important to not mislead customers when a drought is first declared. Rates will probably not return to their pre-drought levels.

New York City, New York
(Extracts from Department of Environmental Protection
Drought Contingency Plan)

Drought Watch (Less than 50% possibility that the major components of the reservoir system [Catskill or Delaware] will fill by June 1.)

City Department of Environmental Protection actions:

1. Initiate public awareness program via media
2. Maximize usage of water from the Croton System by:
 - a. Increase gravity distribution
 - b. Fully utilize the hydraulic pumping stations
 - c. Commence operation of standby electric pumping stations
3. Expand leak detection and repair program
 - a. Create leak survey teams
 - b. Redeploy manpower to address current backlogs
 - c. Utilize overtime to increase output
4. Hydrant surveillance
 - a. Initiate patrols to close illegally opened hydrants and reduce waste
 - b. Exploit contract capability to replace defective leaking hydrants
5. Initiate dialogue with other City agencies concerning actions on their parts to be undertaken should a “Drought Warning” be declared
6. Initiate steps in the Budget process so that additional resources (including manpower) would be in place to be utilized in the event of a “Drought Warning”
7. Inform all “Outside Communities” taking water from N.Y.C.’s water system of situation and request their cooperation in reduction of water consumption
8. Apprise New York State Departments of Health and Environmental Conservation, the Delaware River Master and the Delaware River Basin Commission of system status

Drought Warning (Less than 33% possibility that either the Catskill or Delaware system will fill by June 1.)

City Department of Environmental Protection actions:

1. Continue media campaign stressing voluntary conservation measures and limited restricted usages as mandated
2. Continue maximum utilization of water from the Croton system
3. Implement expanded leak detection program utilizing resources budgeted for “Drought Warning”
4. Utilize Hydrant replacement contracts citywide to permit redeployment of additional in-house forces to the leak program
5. Put the Chelsea Pumping Station on standby status
6. Direct the implementation of Conservation programs by other city agencies
7. Notify all outside communities of required compliance with N.Y.C. water use restrictions, and intent to enforce the maintenance of their drafts within their entitlement
8. Continue efforts with New York State, the Delaware River Master and the Delaware River Basin Commission to manage releases and diversions to effect maximum utilization of available waters
9. Expand program to shut off services to vacant buildings

Actions by other City Agencies:

1. Sanitation Department
Suspend street flushing program
2. Police Department
Assist in closing illegally opened hydrants
3. Parks Department
Restrict golf course watering
No make-up water for artificial lakes and ponds
No continuously running drinking fountains
No un-recirculated ornamental fountains
4. Housing Authority
Request plumbing leak surveys
5. Transit Authority
Request fleet washing 50% cutback
6. Board of Education
Initiate student conservation education program

Drought Emergency (When it becomes necessary to assure that the city's reservoirs will not be drained.)

City Department of Environmental Protection actions:

1. Continue public relations program geared to public information on drought status and over conservation education including mass media and private sector efforts
2. Continue maximum utilization of waters from the Croton System
3. Continue leak detection efforts and a reevaluate leak backlogs as to possible additional resource allocations to correct problems
4. Require "Outside Communities" to implement similar conservation measures
5. With agreement among all parties, continue curtailments in Delaware releases and diversions
6. Initiate leak and waste surveys in private buildings utilizing Water Use Inspectors (defer meter reading program)
7. Staff Hudson River Pumping Station at Chelsea, New York
8. The following regulations will be issued by the Commissioner of Environmental Protection:

Phase I

(a) No person or entity shall:

1. Allow any leak or waste to continue from any water pipe, valve, facet or conduit connected to the city water system on or in any premises owned, used, operated or controlled by such person or entity;
2. Wash any vehicle by means of a hose, fire hydrant, or other active source connected to the city water system, except that a commercial vehicle washing operation may use city water for vehicle washing if, pursuant to the timetable set forth below, equipment is installed and utilized so that at least 50% of the water used is recirculated by means of a system approved by the department. Any facility not now utilizing recirculating equipment shall: (a) submit plans to the department for installation of such equipment within 30 days, (b) submit a copy of an executed contract to install such equipment within 60 days and (c) complete the installation

of such equipment and commence its use within 90 days of the effective date of these regulations;

3. Wash any street, sidewalk, driveway, outdoor area, outdoor steps, building exterior or other structure by means of a hose, fire hydrant, or other active source connected to the city water system;
4. Use water from the city water system for any ornamental purpose, including, but not limited to, use in fountains, artificial waterfalls, reflecting pools, lakes and ponds;
5. Use water from the city water system for the purpose of watering any golf course;
6. Open or use any fire hydrant for any purpose other than fire protection except in accordance with a permit obtained from the department and only for the period of and the purposes authorized by such permit and in strict adherence to all terms and conditions set forth therein;
7. Serve water from the city water system to any patron of a restaurant, club, or other eating place unless specifically requested by such patron;
8. Operate an air conditioning system utilizing water from the city water system in a cooling tower, unless within 30 days from the effective date of this regulation, a separate meter is installed to continuously measure the flow of water to the cooling tower;
9. Operate any air conditioning system in excess of two tons of rated capacity or greater or any refrigeration unit rated at 10 horsepower or greater using water from the city water system, unless such air conditioning system or refrigeration unit is equipped with a water recirculating device approved by the department.

- (b) Each commercial and industrial user of water from the city water system shall prepare a water consumption reduction plan, enabling it to reduce its water in stages of 15%, 20%, and 25%, based upon its average water consumption during calendar year 1980. Such plans shall be designed so as to achieve and maintain the 15% reduction promptly, and to achieve the 20% and 25% reduction immediately upon declaration of a Phase II and Phase III emergency, respectively. Each user is expected to implement the first steps of its plan during Phase I, reducing its consumption by 15%.

Phase II Upon evaluation of results from Phase I, it is determined that a sufficient level of conservation has not been achieved in light of existing water supply conditions, a Phase II shall be declared (in addition to Phase I activities):

- (a) No person or entity shall:
1. Use water from the city water system to fill or maintain the water level in any swimming pools;
 2. Use water from the city water system to water any lawn, ornamental shrub or plant;
- (b) Each commercial or industrial user of water from the city water system shall implement its water consumption reduction plan, reducing use of water by no less than 20%.

Phase III If, after imposition of Phase II, the Commissioner finds that further water consumption must be reduced, Phase III shall be declared (in addition to all previous measures):

- (a) All commercial or industrial users of water from the city water system shall reduce their consumption by no less than 25%;

- (b) All residential users shall install water flow restriction devices in any shower head maintained in any residence;
- (c) All air conditioning systems utilizing water from the city water system shall be operated only in accordance with hourly restrictions established by the Commissioner.

Actions by other City Agencies:

- Department of General Services
 - Building Inspectors to be assigned to plumbing leakage surveys in private buildings
- Fire Department
 - Leak and waste reports from all units to be made on routine fire inspection of buildings
- Finance
 - Inclusion of conservation messages in billings
- WNYC Radio & TV
 - Stress conservation theme in programming; Request presentation of prepared radio and T.V. tapes for public service messages
- Housing (Public and Private)
 - Voluntary installation of flow restricting devices
- Others
 - Same efforts as in “Drought Warning”

Guide For All Water Managers and City Officials
Provided By The Kentucky State
Natural Resources and Environmental Protection Cabinet
(Extracts from Kentucky Water Shortage Response Plan, May 23, 1986)

Water Shortage Advisory

Wells: when supply conditions are especially low, or when another well is showing signs of reduced supply, or when static water level is decreasing faster than usual or when draw down is increasing faster than historically normal for the season.

Streams and Springs: for free-flowing streams and springs when demand is 20 to 40% of flow; for flow-regulated streams, when levels are low in the reservoir behind the regulating dam or when demand is 50 to 65% of flow.

Reservoirs and Impoundments: when there are less than 60 but more than 45 supply days left.)

During a Water Shortage Advisory, the affected public must be notified and requested to use voluntary conservation measures to reduce demand by a specific gallon amount. The notification and request must be accompanied by an educational campaign to show how individuals can conserve water. In most circumstances, voluntary measures can only be expected to reduce water use by 5 to 15 percent.

<u>Water Use Class</u>	<u>Recommended Conservation Response</u>
Essential	Voluntary
Socially or Economically Important	Voluntary
Non-Essential	Voluntary

Essential Water Use

Domestic Uses:

- water necessary to sustain human life and the lives of domestic pets, and to maintain minimum standards of hygiene and sanitation

Health Care Facilities:

- patient care and rehabilitation

Public Use:

- firefighting
- health and public protection purposes, if specifically approved by health officials and the municipal governing body

Socially or Economically Important Uses of Water

All Domestic Use Other Than Those Included in Essential and Non-Essential:

- home water use including kitchen, bathroom and laundry

Outdoor Non-Commercial Watering (public or private)

- agricultural irrigation for the production of food and fiber or the maintenance of livestock
- watering by commercial nurseries at a minimum level necessary to maintain stock, to the extent that sources of water other than fresh water are not available or feasible to use

- water use by arboretums and public gardens of national, state, or regional significance, where necessary to preserve specimens, to the extent that sources of water other than fresh water are not available or feasible to use
- use of fresh water at a minimum rate necessary to implement revegetation following earth moving, where such revegetation is required pursuant to an erosion and sedimentation control plan adopted pursuant to law or regulation, to the extent that sources of water other than fresh water are not available or feasible to use
- watering of golf course greens

Filling and Operation of Swimming Pools:

- residential pools which serve more than 25 dwelling units
- pools used by health care facilities for patient care and rehabilitation
- municipals

Washing of Motor Vehicles:

- commercial car and truck washes, unrestricted hours of operation

Commercial Laundromats:

- unrestricted hours of operation

Restaurants, Clubs and Eating Places:

- unrestricted hours of operation

Air Conditioning:

- refilling for startup at the beginning of the cooling season
- make-up of water during the cooling season
- refilling specifically approved by health officials and the municipal governing body, where the system has been drained for health protection or repair purposes

Schools, Churches, Motel/Hotels and Similar Commercial Establishments:

- unrestricted operation

Non-Essential Uses of Water

Ornamental Purposes:

- fountains, reflecting pools and artificial waterfalls

Outdoor Non-Commercial Watering (public or private):

- gardens, lawns, parks, golf courses (except greens), playing fields and other recreational areas
- exceptions (as defined in Socially or Economically Important Use)

Filling and Operation of Swimming Pools:

- exceptions (as defined in Socially or Economically Important Use)

Washing of Motor Vehicles:

- automobiles, trucks, boats and trailers
- exceptions (as defined in Socially or Economically Important Use)

Serving Water in Restaurants, Clubs, or Eating Places:

- exceptions (specific request by a customer)

Fire Hydrants:

- any purpose, including use of sprinkler caps and testing fire apparatus and for fire department drills
- exceptions (firefighting; health protection purposes, if specifically approved by the health officials of the municipality; certain testing and drills by the fire department, if it is in the interest of public safety, and is approved by the municipal governing body)

Flushing of Sewers and Hydrants:

- exceptions (as needed to ensure public health and safety, and approved by health officials and the municipal governing body)

Air Conditioning:

- refilling cooling towers after draining
- exceptions (as defined in Socially or Economically Important Use)

Water Shortage Alert

Wells: shortage in a well would be abnormally large or rapid increase in drawdown or a large decrease in static water level.

Streams and Springs: for free-flowing streams and springs when demand is 40 to 65% of flow; for flow-regulated streams when dam releases are cut back or when demand is 65 to 75% of flow.

Reservoirs and Impoundments: when there are less than 45 but more than 21 supply days in a reservoir.

During a Water Shortage Alert, mandatory measures should be chosen and implemented by relying first on the least restrictive and least costly measures. Bans or restrictions on specific uses constitute the most effective initial mandatory program measures available for use because of the ability to apply them on both metered and un-metered systems. However, in order to ensure compliance, system users must fully understand that penalties for non-compliance will be used.

Penalties for violating use bans or restrictions must be equitably applied and should be graduated for repeated violations. They may include written warnings, monetary fines, insertion of pressure restriction devices in service lines, or discontinuation of water service.

Since initial mandatory measures can reduce system use from 15 to 30 percent, monitoring to ascertain decreases in water use continue to determine whether more stringent measures, such as full rationing or pricing changes, are necessary.

Water Use Class

Recommended Conservation Response

Essential

Voluntary

Socially or Economically Important

Voluntary

Non-Essential

Mandatory

Water Shortage Emergency

Wells: when significant changes in drawdown or static water levels exist.

Streams and Springs: for free-flowing streams and springs, when demand is 65 to 75% of flow; for flow regulated streams, when dam releases are greatly diminished or when demand is more than 75% of flow.

Reservoirs and Impoundments: when there are less than 21 but more than 14 days available supply.

During a Water Shortage Emergency, stringent conservation measures are needed. Pricing measures and additional mandatory restrictions should be used to significantly reduce water usage during the Emergency phase. In effect, pricing measures constitute economic rationing by allowing a user to continue to use water at any rate desired, but high rates of use will result in a greatly increased cost. Types of pricing

practices that should be used include (1) excess demand or use charges, (2) penalty charges, (3) discounts, and (4) increasing block rates. When using the first three pricing approaches, specific criteria for determining the fixed amounts of water above and below which economic penalties or rewards will be imposed must be clearly delineated.

<u>Water Use Class</u>	<u>Recommended Conservation Response</u>
Essential	Voluntary
Socially or Economically Important	Mandatory
Non-Essential	Mandatory

Water Shortage Rationing

Wells: when supply appears to be running out.

Streams and Springs: when demand is 75% or more than flow; on flow-regulated streams, depends on operational characteristics of the upstream reservoir.

Reservoirs and Impoundments: when less than 14 days of supply is available.

When Rationing is used to address a water shortage situation, three points must be considered. First, rationing is only applicable for metered systems. Second, the decision to employ rationing must acknowledge and address questions of fairness or equity. Third, the type of rationing most appropriate for an individual community must be selected.

The measures that have the greatest potential for significantly reducing water use are rationing and pricing. Together, these can reduce usage from 30 to 70 percent.

<u>Water Use Class</u>	<u>Recommended Conservation Response</u>
Essential	Mandatory
Socially or Economically Important	Mandatory
Non-Essential	Mandatory

OTHER ITEMS:

State Allocation: If local response to a water shortage is inadequate, the state has authority to allocate water supplies among users.

Change in Drought Status

- Once in effect, a Water Shortage Advisory should not be removed until demand is less than 10 percent of flow for a four week period.
- Once in effect, a Water Shortage Alert should not be removed until demand is less than 40 percent of flow for a four week period.
- Once in effect, a Water Shortage Emergency should not be removed until demand is less than 65 percent of flow for a four week period.
- Once in effect, a Water Shortage Rationing should be continued until demand has been less than 75 percent of flow for a four week period.

When water shortage conditions have been abated and the water supply situation is returning to normal, water conservation measures employed during the Advisory, Alert, Emergency, and Rationing phases should be decreased in reverse order of implementation. Permanent measures directed toward long-term monitoring and conservation should be implemented or continued so that the community will be in a better position to prevent future shortages and respond to recurring water shortage conditions.

Charleston, South Carolina
(Extracts from Water Conservation Plan of
The Charleston Commissioners of Public Works, October 28, 1986)

Moderate Drought (When the Palmer Index reaches the -1.50 to -2.99 range and drought conditions have been verified by best available information and this situation is expected to persist.)

The goal during this condition is to achieve a reduction of 20% in residential water use and 10% in other water uses such as commercial, industrial, institutional, agricultural; and a reduction in overall water use of 15%.

1. Issue a Proclamation that the following conservation measures on non-essential water use should be voluntarily followed:
 - a. Eliminate the washing down of sidewalks, walkways, driveways, parking lots, tennis courts, and other hard surfaced areas;
 - b. Eliminate the washing down of buildings for purposes other than immediate fire protection;
 - c. Eliminate the flushing of gutters;
 - d. Limit the domestic washing of motorbikes, boats, cars, etc.;
 - e. Eliminate the use of water to maintain fountains and reflective ponds;
 - f. Restrict landscape watering for even numbered addresses to even numbered days; and for odd numbered addresses to odd numbered days. This includes watering of lawns, plants, trees, gardens, shrubbery, and flora on private or public property and water used by golf courses;
 - g. Activate fire hydrants for fire fighting purposes only;
 - h. Limit agricultural irrigation to between the hours of 5:00 AM and 4:00 PM;
 - i. Limit commercial and industrial users to 90% of normal process water use.
2. Redistribute maintenance efforts to correct and identify water leaks on the distribution system.
3. Encourage and educate customers to comply with voluntary water conservation requests by means of the following:
 - a. Obtain speakers from a Speaker's Bureau to make presentations to garden clubs, civic associations, and homeowner's groups about water conservation;
 - b. Devote publicity to efforts around city and county parks to set exemplary trends for reduced maintenance and water needs;
 - c. Work to have officials of park districts, golf courses, and other large open spaces adopt water conservation plans for maintenance of their grounds;
 - d. Have speakers give talks to students in local high schools and elementary schools about water conservation;
 - e. Distribute brochures and other conservation information through customer service people, water bills, etc.;
 - f. Prepare and maintain a library of electronic media public service spots on water conservation;
 - g. Maximize use of public service announcements on TV and radio;
 - h. Put conservation slogans and decals on appropriate company vehicles.

Severe Drought (When the Palmer Index reaches the -3.00 to -3.99 range and drought conditions have been verified by best available information.)

The goal during this condition is to achieve a reduction of 25% in residential water use and 15% in other water uses such as commercial, industrial, institutional, agricultural; and a reduction in overall water use of 20%.

1. Issue a Proclamation that a Severe Drought condition exists and publish in the newspaper the mandatory and voluntary restrictions to be placed on water uses.
2. Require mandatory compliance with the voluntary restrictions non-essential water use listed under the Moderate Drought conditions. In addition, the following also apply:
 - a. Limit landscape watering to Wednesday and Saturday for odd numbered addresses and Thursday and Sunday for even numbered addresses. Use low level volume hand-held applicators only for domestic landscapes and prohibit the use of sprinklers or other broadcasting devices. Restrict water usage to between 4:00 AM and 12:00 Noon;
 - b. Place a moratorium on the issuance of additional services for landscape irrigation.
3. Publicize widely the penalties to be imposed for violations of mandatory restrictions and the procedure to be followed if a variance in the restrictions is requested.
4. Continue education and public relations efforts as conducted under the Moderate Drought phase and expand to emphasize the penalties associated with violating the mandatory restrictions.

Extreme Drought (When the Palmer Index reaches or falls below -4.00 and drought conditions are verified by best available information.)

The goal during this condition is to achieve a reduction of 30% in residential water use and 10% in all other categories of water uses and a reduction in overall water use of 25%.

1. Issue a Proclamation that an Extreme Drought condition exists and publish in the newspaper the mandatory restrictions on water uses.
2. Continue to restrict non-essential water use in accordance with the provisions under the Severe Drought condition phase.
3. Place a moratorium on the issuance of all new water main extensions.
4. Encourage each domestic water customer to voluntarily reduce overall monthly water usage to 80% of the customer's annual running monthly average unless the customer's running average is 6,000 gallons per month or less.

In the event that voluntary reduction of usage is not successful, the Commissioners of Public Works could, at its option, place a rate surcharge on the customer's portion of water usage over the 80% annual running average in accordance with the following schedule:

Monthly Amount Over 80% of Average

Surcharge Rate

- | | |
|-------------------------------|--|
| 1. First 0 - 2000 gallons | \$ 0.50/1,000 gallons or portion thereof |
| 2. Next 2,000 - 4,000 gallons | \$ 0.75/1,000 gallons or portion thereof |
| 3. Next 4,000 - 6,000 gallons | \$ 1.00/1,000 gallons or portion thereof |
| 4. Over 6,000 gallons | \$ 1.50/1,000 gallons or portion thereof |
5. In the event that the conservation measures of this plan prove inadequate to mitigate the effects of the drought conditions, the Commissioners of Public Works shall limit water use by reduction of water system pressure as needed.

OTHER ITEMS

Penalties and Termination of Service: In the event that any customer fails to comply with the mandatory water use restrictions of this plan, the customer shall be notified either in person or by certified mail of said violation and shall be assessed penalties in accordance with the following schedule:

1. First violation - \$30.00 penalty shall be assessed toward the customer's water bill;
2. Second violation - an additional \$50.00 penalty shall be assessed toward the customer's water bill;
3. Third violation - the customer's water service shall be terminated and restored only after payment of a penalty of \$100.00, in addition to all previously assessed penalties.

St. Johns River Water Management District, Florida
(Extracts from Chapter 40C-21, Water Shortage Plan, January 1, 1984)

Phase I Moderate Water Shortage (Anticipated reduction in overall demand of 15% is required to reduce estimated present and anticipated demand to equal present and anticipated available water supply or protect the water resource from serious harm.)

The following restrictions will apply when a Phase I water shortage is declared:

- (1) Essential/Domestic/Utility/Commercial
 - a) Essential Use
 1. The use of water for firefighting, and health or medical purposes will not be restricted.
 2. Fire hydrant flushing should be undertaken only on an emergency basis.
 3. Sanitary sewer line flushing and testing will not be restricted except on a voluntary basis.
 - b) Household and Domestic Type Use
 1. Residential type domestic use should be voluntarily reduced to achieve a per capita consumption of 60 gallons per person per day.
 2. Domestic type use in industrial and commercial establishments should be voluntarily reduced.
 - c) Water Utility Use
 1. Initial pressure at the point of use (meter) should be voluntarily reduced by 15% where it is operationally feasible to do so.
 2. New water line flushing and disinfection will be restricted to the hours of 9:00 p.m. and 7:00 a.m., seven days a week.
 3. As appropriate the utility should institute additional voluntary conservation measures such as reclaiming of backwash water, improving and accelerating leak detection surveys and repair programs, installing and calibrating meters, and stabilizing and equalizing system pressures.
 - d) Power Production Use
 1. Water used for power production should be voluntarily reduced.
 - e) Commercial and Industrial Process Use
 1. Commercial car washes will be restricted as follows:
 - a. for washes servicing passenger vehicles and mobile equipment weighing less than 10,000 pounds
 - i. use in excess of 75 gallons per wash will be prohibited, and
 - ii. use equal to or less than 75 gallons per wash should be voluntarily reduced;
 - b. for washes servicing mobile equipment weighing 10,000 pounds or more,
 - i. use in excess of 150 gallons per wash will be prohibited, and
 - ii. use equal to or less than 150 gallons per wash should be voluntarily reduced.
 2. Water used for commercial and industrial process should be voluntarily reduced.

(2) Agriculture

a) Agricultural Use

1. Overhead irrigation, except by portable volume gun, will be restricted to the hours of 2:00 p.m. to 10:00 a.m.
2. Flood and seepage irrigation will not discharge tailwaters from the property, however, this restriction will not apply to agricultural uses in the production of watercress planted prior to the declaration of a water shortage.
3. Low volume irrigation hours will not be restricted.
4. All irrigation systems will be operated in a manner that will maximize the percentage of water withdrawn and held which is placed in the root zone of the crop and will minimize the amount of water which is withdrawn and released or lost to the user but is not immediately available for other users.

b) Livestock Use

1. Livestock water use should be voluntarily reduced.

c) Aquacultural Use

1. Aquacultural water use should be voluntarily reduced.

d) Soil Flooding

1. Soil flooding for pest control or soil preservation will be prohibited.
2. Soil flooding to permit harvesting of sod should be voluntarily reduced.

e) Freeze Protection

1. Water use for freeze protection will be restricted to situations in which official weather forecasting services predict temperatures likely to cause permanent damage to crops and when the wet bulb temperature drops to 34 Fahrenheit or lower.

(3) Nursery/Landscape Irrigation/Recreation

a) Nursery Use

1. Low volume irrigation uses and low volume hand watering should be voluntarily reduced.
2. Overhead irrigation uses will be restricted as follows:
 - a. inside - 8:00 a.m. to 8:00 p.m., seven days per week
 - b. outside - 7:00 p.m. to 7:00 a.m., seven days per week
3. Flood irrigation systems will be restricted to 8 days per month.

b) Landscape Irrigation - New Installation

1. For installations which have been in place less than 30 days and
 - a. Less than 5 acres in size, water use for irrigation will be restricted to the hours of 2:00 a.m. to 8:00 a.m., Monday through Friday,
 - b. 5 acres or greater in size, water use for irrigation will be restricted to the hours of 12:01 a.m. to 8:00 a.m. Monday through Friday.
2. Low volume hand watering of new landscaping should be voluntarily reduced.
3. Cleaning and adjusting of new irrigation systems will be restricted to 10 minutes per zone on a one time basis.

c) Landscape Irrigation - Existing Installation

1. For existing installations less than 5 acres in size, water use for irrigation will be restricted to the hours from 4:00 a.m. to 8:00 a.m., three days a week.
 - a. Installations with odd addresses will be permitted to irrigate on Monday, Wednesday, and Saturday.
 - b. Installations with even addresses or no address will be permitted to irrigate on Tuesday, Thursday and Sunday.

2. For existing installations 5 acres or greater in size, water use for irrigation will be restricted to the hours from 12:01 a.m. to 8:00 a.m., three days per week.
 - a. Installations with odd addresses will be permitted to irrigate on Monday, Wednesday and Saturday.
 - b. Installations with even addresses or no addresses will be permitted to irrigate on Tuesday, Thursday and Sunday.

d) Recreation Area Use

1. Existing and new recreation area water use will be restricted as provided in paragraphs b) and c) respectively.

e) Golf Course Use

1. Irrigation of greens and tees should be voluntarily reduced and will be accomplished during non-daylight hours.
2. Irrigation of fairways, roughs and nonplaying areas on the first nine holes of the course will be restricted to the hours of 12:01 a.m. to 8:00 a.m. on Monday, Wednesday and Saturday.
3. Irrigation of fairways, roughs and nonplaying areas on the last nine holes of the course will be restricted to the hours of 12:01 a.m. to 8:00 a.m. on Tuesday, Thursday and Sunday.

f) Water Based Recreation Use

1. Water based recreation water use should be voluntarily reduced.
2. Draining of facilities into sewers or onto impervious surfaces will be prohibited.

(4) Miscellaneous

a) Heating and Air Conditioning Use

1. The use of water for heating will be restricted to that amount of water necessary to maintain a maximum temperature of 68 degrees Fahrenheit.
2. The use of water for cooling and air conditioning will be restricted to that amount of water necessary to maintain a minimum temperature of 78 degrees Fahrenheit.

b) Dewatering Use

1. Discharge of fresh water to tide from dewatering will be prohibited.

c) Other Outside Uses

1. Washing and cleaning streets, driveways, sidewalks, or other impervious areas with water will be prohibited.
2. Mobile equipment washing with water will be restricted to the hours and days prescribed for existing landscape irrigation in paragraph (3) c), using only low volume methods.
3. Outside pressure cleaning shall be restricted to only low volume methods, seven days per week.

d) Aesthetic Use

1. Outside aesthetic uses of water will be prohibited.
2. Inside aesthetic uses of water should be voluntarily reduced.

Phase II Severe Water Shortage (Anticipated reduction in overall demand of 30% is required to reduce estimated present and anticipated demand to equal present and anticipated available water supply or protect the water resource from serious harm.)

The following restrictions shall apply when a Phase II water shortage is declared by the District.

(1) Essential/Domestic/Utility/Commercial

a) Essential Use

1. The use of water for firefighting, and health or medical purposes will not be restricted.
2. Fire hydrant flushing should be undertaken only on an emergency basis.
3. Sanitary sewer line flushing and testing will not be restricted except on a voluntary basis.

b) Household and Domestic Type Use

1. Residential type domestic use should be voluntarily reduced to achieve a per capita consumption of 50 gallons per person per day.
2. Domestic type use in industrial and commercial establishments should be voluntarily reduced.

c) Water Utility Use

1. Initial pressure at the point of use (meter) should be voluntarily reduced by 15% where it is operationally feasible to do so.
2. New water line flushing and disinfection will be restricted to the hours of 9:00 p.m. to 7:00 a.m. seven days per week.
3. As appropriate the utility should institute additional voluntary conservation measures such as reclaiming of backwash water, improving and accelerating leak detection surveys and repair programs, installing and calibrating meters, and stabilizing and equalizing system pressures.

d) Power Production Use

1. Water used for power production should be voluntarily reduced.

e) Commercial and Industrial Process Use

1. Commercial car washes will be restricted as follows:
 - a. for washes servicing passenger vehicles and mobile equipment weighing less than 10,000 pounds,
 - i. use in excess of 75 gallons per wash will be prohibited, and
 - ii. use equal to or less than 75 gallons per wash should be voluntarily reduced;
 - b. for washes servicing mobile equipment weighing 10,000 pounds or more,
 - i. use in excess of 150 gallons per wash will be prohibited and
 - ii. use equal to or less than 150 gallons per wash should be voluntarily reduced.
2. Water used for commercial and industrial process should be voluntarily reduced.

(2) Agriculture

a) Agricultural Use

1. Overhead irrigation, except by portable volume gun, will be restricted to the hours of 2:00 p.m. to 10:00 a.m.
2. Flood and seepage irrigation will not discharge tailwaters from the property.
3. Low volume irrigation hours will not be restricted.
4. All irrigation systems will be operated in a manner that will maximize the

percentage of water withdrawn and held which is placed in the root zone of the crop and will minimize the amount of water which is withdrawn and released or lost to the user but is not immediately available for other uses.

b) Livestock Use

1. Livestock water use should be voluntarily reduced.

c) Aquacultural Use

1. Aquacultural water use should be voluntarily reduced.

d) Soil Flooding

1. Soil flooding for pest control or soil preservation will be prohibited.
2. Soil flooding to permit harvesting of sod should be voluntarily reduced.

e) Freeze Protection

Water use for freeze protection will be restricted to situations in which official weather forecasting services predict temperatures likely to cause permanent damage to crops and when the wet bulb temperature drops to 43 Fahrenheit or lower.

(3) Nursery/Landscape Irrigation/Recreation

a) Nursery Use

1. Low volume irrigation uses and low volume hand watering should be voluntarily reduced.
2. Overhead irrigation uses will be restricted as follows:
 - a. inside - 8:00 a.m. to 8:00 p.m., seven days per week
 - b. outside - 7:00 p.m. to 7:00 a.m., on odd numbered days.
3. Flood irrigation systems will be restricted to 6 days per month.

b) Landscape Irrigation - New Installation

1. For installations which have been in place less than 30 days, and
 - a. less than 5 acres in size, water use for irrigation will be restricted to the hours of 2:00 a.m. to 8:00 a.m., Monday, Wednesday and Friday,
 - b. 5 acres or greater in size, water use for irrigation will be restricted to the hours of 12:01 a.m. to 8:00 a.m. Monday, Wednesday, Thursday and Friday.
2. Low volume hand watering of new landscaping should be voluntarily reduced.
3. Cleaning and adjusting of new irrigation systems will be restricted to 10 minutes per zone on a one-time basis.

c) Landscape Irrigation - Existing Installation

1. For existing installations less than 5 acres in size, water use for irrigation will be restricted to the hours from 4:00 a.m. to 8:00 a.m., two days a week.
 - a. installations with odd addresses will be permitted to irrigate on Wednesday and Saturday.
 - b. installations with even addresses or no address will be permitted to irrigate on Thursday and Sunday.
2. For existing installations 5 acres or greater in size, water use for irrigation will be restricted to the hours from 12:01 a.m. to 8:00 a.m., two days per week.
 - a. installations with odd addresses will be permitted to irrigate on Wednesday and Saturday.

installations with even addresses or no addresses will be permitted to irrigate on Thursday and Sunday.

d) Recreation Area Use

Existing and new recreation area water use will be restricted as provided in paragraphs b) and c) respectively.

e) Golf Course Use

1. Irrigation of greens and tees should be voluntarily reduced and will be accomplished during non-daylight hours.
2. Irrigation of fairways, roughs and nonplaying areas on the first nine holes of the course will be restricted to the hours of 12:01 a.m. to 8:00 a.m. on Wednesday and Saturday.
3. Irrigation of fairways, roughs and nonplaying areas on the last nine holes of the course will be restricted to the hours of 12:01 a.m. to 8:00 a.m. on Thursday and Sunday.

f) Water Based Recreation Use

1. Water based recreation water use should be voluntarily reduced.
2. Draining of facilities into sewers or onto impervious surfaces will be prohibited.
3. Existing facilities will not be refilled except for makeup water.

(4) Miscellaneous

a) Heating and Air Conditioning Use

1. The use of water for heating will be restricted to that amount of water necessary to maintain a maximum temperature of 68 degrees Fahrenheit.
2. The use of water for cooling and air conditioning will be restricted to that amount of water necessary to maintain a minimum temperature of 78 degrees Fahrenheit.

b) Dewatering Use

Discharge of fresh water to tide from dewatering will be prohibited.

c) Other Outside Uses

1. Washing and cleaning streets, driveways, sidewalks, or other impervious areas with water will be prohibited.
2. Mobile equipment washing with water will be restricted to the hours and days prescribed for existing landscape irrigation in paragraph (3) c), using only low volume methods.
3. Outside pressure cleaning shall be restricted to only low volume methods, seven days per week.

d) Aesthetic Use

1. Outside aesthetic uses of water will be prohibited.
2. Inside aesthetic uses of water should be voluntarily reduced.

Phase III Extreme Water Shortage (Anticipated reduction in overall demand of 45% is required to reduce estimated present and anticipated demand to equal present and anticipated available water supply or protect the water resource from serious harm.)

The following restrictions shall apply when a Phase III water shortage is declared by the District.

(1) Essential/Domestic/Utility/Commercial

a) Essential Use

1. The use of water for firefighting, and health or medical purposes will not be restricted.

2. Fire hydrant flushing should be undertaken only on an emergency basis.
3. Sanitary sewer line flushing and testing will not be restricted except on a voluntary basis.

b) Household and Domestic Type Use

1. Residential type domestic use should be voluntarily reduced to achieve a per capita consumption of 40 gallons per person per day.
2. Domestic type use in industrial and commercial establishments should be voluntarily reduced.

c) Water Utility Use

1. Initial pressure at the point of use (meter) should be voluntarily reduced by 15% where it is operationally feasible to do so.
2. New water line flushing and disinfection will be restricted to the hours of 9:00 p.m. to 7:00 a.m., seven days per week.
3. As appropriate the utility should institute additional voluntary conservation measures such as reclaiming of backwash water, improving and accelerating leak detection surveys and repair programs, installing and calibrating meters, and stabilizing and equalizing system pressures.

d) Power Production Use

Water used for power production should be voluntarily reduced.

e) Commercial and Industrial Process Use

1. Commercial car washes will be restricted as follows:
 - a. for washes servicing passenger vehicles and nobile equipment weighing less than 10,000 pounds,
 - i. use in excess of 75 gallons per wash will be prohibited, and
 - ii. use equal to or less than 75 gallons but more than 50 gallons per wash will be restricted to the hours of 8:00 a.m. through 3:00 p.m., and
 - iii. use equal to or less than 50 gallons per wash should be voluntarily reduced;
 - b. for washes servicing mobile equipment weighing 10,000 pounds or more,
 - i. use in excess of 150 gallons per wash will be prohibited.
 - ii. use equal to or less than 150 gallons but more than 100 gallons per wash will be restricted to the hours of 8:00 a.m. through 3:00 p.m., and
 - iii. Use equal to or less than 100 gallons per wash should be voluntarily reduced.
2. Water used for commercial and industrial process should be voluntarily reduced by 15%. The 15% reduction will be based upon the permitted allocation of water for the process or water used during a similar period from the previous year.

(2) Agriculture

a) Agricultural Use

1. Overhead irrigation, except by portable volume gun, will be restricted to the hours of 7:00 p.m. to 9:00 a.m.
2. Flood and seepage irrigation will not discharge tailwaters from the property.

3. Low volume irrigation hours will not be restricted.
4. All irrigation systems will be operated in a manner that will maximize the percentage of water withdrawn and held which is placed in the root zone of the crop and will minimize the amount of water which is withdrawn and released or lost to the user but is not immediately available for other users.
5. The District's allocation for agricultural irrigation will be determined based on its evaluation of the supply capabilities of the source class, the supply capabilities of other source classes available in the area, the needs of agriculture and all other users in the area and the District's overall management strategy for handling the uncertainties of future climatological events. The share of the total agricultural irrigation allocation available to each user will be based on any prioritization among crops the District establishes based on economic loss and equity considerations and the acreage and quantity of withdrawals for which the user has been permitted.

b) Livestock Use

Livestock water use should be voluntarily reduced.

c) Aquacultural Use

Aquacultural water use should be voluntarily reduced.

d) Soil Flooding

1. Soil flooding for pest control or soil preservation will be prohibited.
2. Soil flooding to permit harvesting of sod should be voluntarily reduced.

e) Freeze Protection

Water use for freeze protection will be restricted to situations in which official weather forecasting services predict temperatures likely to cause permanent damage to crops and when the wet bulb temperature drops to 34 Fahrenheit or lower.

(3) Nursery/Landscape Irrigation/Recreation

a) Nursery Use

1. Low volume irrigation uses and low volume hand watering should be voluntarily reduced.
2. Overhead irrigation uses will be restricted as follows:
 - a. inside - 8:00 a.m. to 8:00 p.m., on odd numbered days
 - b. outside - 12:01 a.m. to 7:00 p.m., on odd numbered days.
3. Flood irrigation systems will be restricted to 4 days per month.

b) Landscape Irrigation - New Installation

1. For installations which have been in place less than 30 days and
 - a. less than 5 acres in size, water use for irrigation will be restricted to the hours of 2:00 a.m. to 7:00 a.m., Monday, Wednesday and Friday,
 - b. 5 acres or greater in size, water use for irrigation will be restricted to the hours of 12:01 a.m. to 7:00 a.m. Monday, Wednesday, Thursday and Friday.
2. Low volume hand watering of new landscaping should be voluntarily reduced.
3. Cleaning and adjusting of new irrigation systems will be restricted to 10 minutes per zone on a one time basis.

c) Landscape Irrigation - Existing Installation

1. For existing installations less than 5 acres in size, water use for irrigation will be restricted to the hours from 4:00 a.m. to 7:00 a.m., one day per week.
 - a. installations with odd addresses will be permitted to irrigate on Saturday.
 - b. installations with even addresses or no address will be permitted to irrigate on Sunday.
2. For existing installations 5 acres or greater in size, water use for irrigation will be restricted to the hours from 12:01 a.m. to 8:00 a.m., one day per week.
 - a. installations with odd addresses will be permitted to irrigate on Saturday.
 - b. installations with even addresses or no addresses will be permitted to irrigate on Sunday.

d) Recreation Area Use

Existing and new recreation area water use will be restricted as provided in paragraphs b) and c) respectively.

e) Golf Course Use

1. Irrigation of greens and tees should be voluntarily reduced and will be accomplished during non-daylight hours.
2. Irrigation of tees will be restricted to non-daylight hours three days per week. The front nine holes will be restricted to Monday, Wednesday and Saturday and the back nine holes will be restricted to Tuesday, Thursday and Sunday.
3. Irrigation of fairways, roughs and nonplaying areas on the first nine holes of the course will be restricted to the hours of 12:01 a.m. to 7:00 a.m. on Saturday.
4. Irrigation of fairways, roughs and nonplaying areas on the last nine holes of the course will be restricted to the hours of 12:01 a.m. to 7:00 a.m. on Sunday.

f) Water Based Recreation Use

1. Water based recreation water use should be voluntarily reduced.
2. Draining of facilities into sewers or onto impervious surfaces will be prohibited.
3. Existing facilities will not be refilled except for makeup water.

(4) Miscellaneous

a) Heating and Air Conditioning Use

1. The use of water for heating will be restricted to that amount of water necessary to maintain a maximum temperature of 68 degrees Fahrenheit.
2. The use of water for cooling and air conditioning will be restricted to that amount of water necessary to maintain a minimum temperature of 78 degrees Fahrenheit.

b) Dewatering Use

1. Discharge of fresh water to tide from dewatering will be prohibited.
2. Discharge offsite of fresh water from dewatering will be prohibited.

c) Other Outside Uses

1. Washing and cleaning streets, driveways, sidewalks, or other impervious areas with water will be prohibited.
2. Mobile equipment washing with water will be restricted to the hours and days prescribed for existing landscape irrigation in paragraph (3) c), using only low volume methods.
3. Outside pressure cleaning restricted to only low volume methods, Monday through Friday.

d) Aesthetic Use

1. Outside aesthetic uses of water will be prohibited.
2. Inside aesthetic uses of water will be prohibited.

Phase IV Critical Water Shortage (Anticipated reduction in overall demand of 60% is required to reduce estimated present and anticipated demand to equal present and anticipated available water supply or protect the water resource from serious harm.)

The following restrictions shall apply when a Phase IV water shortage is declared by the District.

(1) Essential/Domestic/Utility/Commercial

a) Essential Use

1. The use of water for firefighting, and health or medical purposes will not be restricted.
2. Fire hydrant flushing should be undertaken only on an emergency basis.
3. Sanitary sewer line flushing and testing will be undertaken only on an emergency basis.

b) Household and Domestic Type Use

1. Residential type domestic use should be voluntarily reduced to achieve a per capita consumption of 30 gallons per person per day.
2. Domestic type use in industrial and commercial establishments will be voluntarily reduced to the minimum levels necessary to preserve public health and safety.

c) Water Utility Use

1. Initial pressure at the point of use (meter) should be voluntarily reduced by 15% where it is operationally feasible to do so.
2. New water line flushing and disinfection will be restricted to the hours of 9:00 p.m. to 7:00 a.m. seven days per week.
3. As appropriate the utility should institute additional voluntary conservation measures such as reclaiming of backwash water, improving and accelerating leak detection surveys and repair programs, installing and calibrating meters, and stabilizing and equalizing system pressures.

d) Power Production Use

Water used for power production should be voluntarily reduced.

e) Commercial and Industrial Process Use

1. Commercial car washes will be restricted as follows:
 - a. for washes servicing passenger vehicles and mobile equipment weighing less than 10,000 pounds,
 - i. use in excess of 75 gallons per wash will be prohibited,
 - ii. use equal to or less than 75 gallons but more than 50 gallons per wash will be restricted to the hours of 8:00 a.m. through 3:00 p.m., and
 - iii. use equal to or less than 50 gallons per wash should be voluntarily reduced;
 - b. for washes servicing mobile equipment weighing 10,000 pounds or more,
 - i. use in excess of 150 gallons per wash will be prohibited,
 - ii. use equal to or less than 150 gallons but more than 100 gallons per wash will be restricted to the hours of 8:00 a.m. through 3:00 p.m., and
 - iii. use equal to or less than 100 gallons per wash should be voluntarily reduced.
2. Water used for commercial and industrial process should be voluntarily reduced by 15%. The 15% reduction will be based upon the permitted allocation of water for the process or water used during a similar period from the previous year.

(2) Agriculture

a) Agricultural Use

1. Overhead irrigation, except by portable volume gun, will be restricted to the hours of 7:00 p.m. to 9:00 a.m.
2. Flood and seepage irrigation will not discharge tailwaters from the property.
3. Low volume irrigation hours will not be restricted.
4. All irrigation systems will be operated in a manner that will maximize the percentage of water withdrawn and held which is placed in the root zone of the crop and will minimize the amount of water which is withdrawn and released or lost to the user but is not immediately available for other users.
5. The District's allocation for agricultural irrigation will be determined based on its evaluation of the supply capabilities of the source class, the supply capabilities of other source classes available in the area, the needs of agriculture and all other users in the area and the District's overall management strategy for handling the uncertainties of future climatological events. The share of the total agricultural irrigation allocation available to each user will be based on any prioritization among crops the District establishes based on economic loss and equity considerations and the acreage and quantity of withdrawals for which the user has been permitted.

b) Livestock Use

Livestock water use should be voluntarily reduced.

c) Aquacultural Use

Aquacultural water use should be voluntarily reduced.

d) Soil Flooding

1. Soil flooding for pest control or soil preservation will be prohibited.
2. Soil flooding to permit harvesting of sod will be prohibited.

e) Freeze Protection

Water use for freeze protection will be restricted to situations in which official weather forecasting services predict temperatures likely to cause permanent damage to crops and when the wet bulb temperature drops to 34 Fahrenheit or lower.

(3) Nursery/Landscape Irrigation/Recreation

a) Nursery Use

1. Low volume irrigation uses and low volume hand watering should be voluntarily reduced.
2. Overhead irrigation uses will be restricted as follows:
 - a. inside - 8:00 a.m. to 4:00 p.m., on odd numbered days
 - b. outside - 2:00 a.m. to 7:00 p.m., on odd numbered days.
3. Flood irrigation systems will be restricted to 2 days per month.

b) Landscape Irrigation - New Installation

1. For installations which have been in place less than 30 days and
 - a. less than 5 acres in size, water use for irrigation will be restricted to the hours of 6:00 a.m. to 7:00 a.m., Saturday.
 - b. 5 acres or greater in size, water use for irrigation will be restricted to the hours of 4:00 a.m. to 7:00 a.m. Saturday.
2. Low volume hand watering of new landscaping will be restricted to Monday, Wednesday and Friday.
3. Cleaning and adjusting of new irrigation systems will be prohibited.

c) Landscape Irrigation - Existing Installation

1. For existing installations less than 5 acres in size, water use for irrigation will be restricted to the hours from 6:00 a.m. to 7:00 a.m., one day per week.
 - a. installations with odd addresses will be permitted to irrigate on Saturday.
 - b. installations with even addresses or no address will be permitted to irrigate on Sunday.
2. For existing installations 5 acres or greater in size, water use for irrigation will be restricted to the hours from 4:00 a.m. to 7:00 a.m., one day per week.
 - a. installations with odd addresses will be permitted to irrigate on Saturday.
 - b. installations with even addresses or no addresses will be permitted to irrigate on Sunday.

d) Recreation Area Use

Existing and new recreation area water use will be restricted as provided in paragraphs b) and c) respectively.

e) Golf Course Use

1. Irrigation of greens and tees should be voluntarily reduced and will be accomplished during non-daylight hours.

2. Irrigation of tees will be restricted to non-daylight hours one day per week. The front nine holes will be restricted to Saturday and the back nine holes will be restricted to Sunday.
3. Irrigation of fairways, roughs and nonplaying areas on the first nine holes of the course will be restricted to the hours of 4:00 a.m. to 7:00 a.m. on Saturday.
4. Irrigation of fairways, roughs and nonplaying areas on the last nine holes of the course will be restricted to the hours of 4:00 a.m. to 7:00 a.m. on Sunday.

f) Water Based Recreation Use

Water based recreation water use will be restricted, as follows:

1. Draining of facilities into sewers or onto impervious surfaces will be prohibited.
2. Filling of new or existing facilities will be prohibited.

(4) Miscellaneous

a) Heating and Air Conditioning Use

1. The use of water for heating will be restricted to that amount of water necessary to maintain a maximum temperature of 68 degrees Fahrenheit.
2. The use of water for cooling and air conditioning will be restricted to that amount of water necessary to maintain a minimum temperature of 78 degrees Fahrenheit
3. Heating and air conditioning systems will not discharge water to tide.
4. Reuse of water will be required.

b) Dewatering Use

1. Discharge of fresh water to tide from dewatering will be prohibited.
2. Discharge offsite of fresh water from dewatering will be prohibited.

c) Other Outside Uses

1. Washing and cleaning streets, driveways, sidewalks, or other impervious areas with water will be prohibited.
2. Mobile equipment washing with water will be restricted to the hours and days prescribed for existing landscape irrigation in paragraph (3) c), using only low volume methods.
3. Outside pressure cleaning shall be restricted to only low volume methods, Monday and Wednesday.

d) Aesthetic Use

1. Outside aesthetic uses of water will be prohibited.
2. Inside aesthetic uses of water will be prohibited.

Des Moines Water Works
(Extracts from Water Conservation Plan Water Shortage (Drought))

Stage I (When flows at SE 14th St. Bridge are less than 200 CFS request release of storage water. When water has been released from storage and there is an indication that without wise usage of water, a shortage could occur.)

1. Conscientious use of water will be encouraged as described below:
 - a) Water lawns early in the morning, prior to 6:00 a.m.
 - b) Check the interior plumbing for faucet or toilet leaks and make the necessary repairs.
 - c) Clean outside surfaces such as patios, driveways and sidewalks using a broom rather than a hose.
 - c) Wash vehicles with a bucket and hose that has a shut-off nozzle, rather than continuously running a hose.
 - e) Fill sinks with water for tasks such as washing dishes, preparing food, brushing teeth and shaving rather than leaving water running.
 - f) Suggest installing water-saving devices in showers.
 - g) Use automatic dishwashers and washing machines with only full loads whenever possible.
 - h) Store a container of drinking water in the refrigerator rather than running water from the faucet to cool it.
 - i) Encourage wise use of water during outdoor play, e.g., playing in the sprinkler, water toys and swimming pools.
 - j) Encourage shorter shower times, or bathe in partially full bathtubs.
 - k) Refrain from using the toilet as a wastebasket or ashtray.
2. Suspend hydrant flushing program.
3. Request city officials to minimize water usage activities such as street flushing and watering golf courses. Be sure that all other activities are suspended before an emphasis is placed on golf courses.

Stage II (After 30 days or less, if the maximum day water conservation (under Stage I) has not been reduced by 10%, and there is still an indication that a water shortage could occur.)

1. Further encourage voluntary activities to reduce consumption as follows:
 - a) Request residential areas to water on alternative days, e.g., even numbered addresses may water on even numbered days of the month, and odd numbered addresses may water on odd numbered days of the month. Suggest watering between 8:00 p.m. and 6:00 a.m. during weekdays. Weekend watering could be conducted at anytime.
 - b) Restate voluntary measures of Stage I.
2. Contact public agencies (city, county, state) to request assistance in implementing measures to conserve usage associated with their operations (to serve as an example for citizens) such as:
 - a) Consider closing recreational facilities with known water wastes, e.g., leaking pools and running drinking fountains.
 - b) Suspend the operation of decorative fountains.
3. Survey areas of highly corrosive soils (indicated by failure history) with leak detection crews.
4. Recommend serving drinking water in eating establishments only when specifically requested by patrons.

5. Recommend to the Board of Water Works Trustees that the water shortage rate structure go into effect in Stage III.

Stage III (After 30 days or less, if the maximum day water conservation (under Stage II) has not been reduced by 30%, and there is still an indication that a water shortage could occur.)

1. Mandatory measures will be implemented as follows:
 - a) Discontinue outdoor water usage (including filling pools, watering lawns, hose-washing of paved surfaces, etc.), except for commercial greenhouses.
 - b) Discontinue public agency watering activities (including landscapes, flower beds, grasses, and annual plantings).
2. Implement the water shortage rate structure.

Stage IV (After 30 days or less, if the maximum day water conservation (under Stage III) has not been reduced by 30%, and there is still an indication that a water shortage could occur.)

1. Further promote conservative water usage as follows:

Impose consumption reduction of 30% for all residential usages above minimum bills (allow use of 70% of consumption from the same period of the previous year) and 90% for commercial and industrial uses, inclusive of all hospitals and health care facilities. Any new customers applying for water service at this time will be notified that the conservation plan is in effect and the restrictions involved. Through a message on their water bills, customers will be made aware of their usage and its relationship to the maximum allowable usage.
2. If necessary, the use of water may be suspended or restricted by category of use, in the following order:
 - a) Water used primarily for recreational or aesthetic purposes (if not already restricted under Stage III).
 - b) Use of water for all irrigation purposes.
 - c) Use of water for manufacturing or other industrial processes.
 - d) Use of water for the generation of electrical power for public consumption.
 - e) Use of water for livestock production.
3. Any other measures deemed necessary by the Des Moines Water Works.

OTHER ITEMS

Penalties: The following penalties will be assessed in the event of violation of the mandatory measures:

- a) The first violation will result in a written warning re-emphasizing ways to conserve usage, and a notice of intent to impose a surcharge effective with the next water bill if the violation condition persists.
- b) The second violation will result in the imposition of a flat surcharge of \$100.00, which will be assessed for open violation of mandatory measures. A surcharge for usage in excess of allotments for residential and commercial users shall be \$5.00 per 1,000 gallons used in excess of the respective allotments. Normal collection practices and procedures will be imposed on all customers who fail to pay the surcharges.

Grievance Procedure:

Any customer aggrieved by the application of these procedures, including any person disputing the amount of any surcharge or validity of any violation, may request a hearing before an appeals committee. The committee shall consist of the Des Moines Water Works General Manager, or his designee, the Director of Finance and the Director of General Services. Such a hearing shall be held as soon as reasonably practical.

The committee shall review the issue presented and shall, in its judgement, **promote public safety, avoid unjust discrimination and do substantial justice.** (Emphasis added by editor)

City of Millbrae, California
(Extracts from Water Shortage Contingency Plan, January 1992)

Stage I (Ongoing. Supply Shortage: 0 - 5%)

Goal: To voluntarily reduce water waste and increase use efficiency.

1. Ongoing measures include those specified in the Urban Water Management Plan and the Memorandum of Understanding Regarding Urban Water Use in California:
 - a. Interior/exterior commercial and residential customer audits.
 - b. New service connections must incorporate water-saving fixtures and devices.
 - c. Enforcement of plumbing regulations effective January 1, 1992, require ultra low-flush toilets in all new construction.
 - d. Customer toilet rebate program for low-flush and ultra low-flush toilets to a budget limit of \$10,000.
 - e. Distribution system audits, leak detection and repair. Budget \$10,000.
 - f. Offer large landscape audits.
 - g. Enforce water conservation landscape requirements effective for new and existing commercial and residential customers.
 - h. Conduct ongoing public information program. Use the news media, educational brochures and bill inserts. Target specific information to selected customer segments. Budget \$2,500.
 - i. Institute elementary school program each Fall. Order and deliver all needed materials to schools. Budget \$1,000.
 - j. Distribute low-flow showerheads and water-saving device kits to customers free of cost. Budget \$5,000
2. Detail historic water use on customer bills. Capture consumption same period previous year and average daily use.
3. Instruct and encourage use of minimum amount of water for street cleaning, main flushing, landscape needs, etc.
4. All leaks are to be repaired within 10 days of notification.
5. Analyze water rate structure. Evaluate best financial incentive to encourage conservation through rate-paying.

Stage II (Supply from San Francisco Water Department (SFWD) is 90 - 95% of normal for next year based on snowpack measurements and projected runoff.)

Goal: 10% voluntary reduction.

1. All Stage I plan elements are to be continued.
2. Request voluntary 10% conservation. Prepare and disseminate educational brochures and other information. Target technical information to specific customer types on ways to save water. Budget \$6,500.
3. Enhance public information campaign. Coordinate an increased media program. Issue news releases. Advertise reminders of the need to save water. Describe supply situation in relation to present demand. Coordinate conservation information speakers bureau. Budget \$5,000.
4. Implement non-essential use Plan restrictions on a voluntary basis as follows:
 - a. Hoses must be equipped with positive shut-off valve.
 - b. No irrigation between 10:00 a.m. and 6:00 p.m.
 - c. No use of water resulting in runoff.
 - d. Decorative fountains must use recycled water.
 - e. Water for cooling purposes must be recycled.

Stage III (Supply from SFWD is 80 - 90% of normal based on snowpack measurements and runoff projects for next year.)

Goal: 20% voluntary reduction.

1. All Stage II plan elements are to be continued.
2. Increase public information efforts to a budget limit of \$10,000. Increase community representative public speaking role to convey conservation information to targeted customers. Request that customers voluntarily reduce use by 20%.
3. Increase low-flow showerhead and water-saving toilet device giveaway program to a budget limit of \$9,000.
4. Implement Plan to reflect additional non-essential voluntary water use restrictions:
 - a. Cars to be washed with bucket and hose with shut-off valve.
 - b. No use of potable water for backfill consolidation, dust control, or other non-essential construction purposes.
 - c. No washing of hard surfaces such as walkways, buildings, etc.
 - d. No service of water by restaurant, bar, etc., except to person requesting the water.
 - e. No use of water from unmetered outlets or hydrants except for approved purposes.
5. Encourage municipal agencies to further reduce water use for street cleaning, main flushing, landscaping in parks, schools, etc.
6. Increase efforts to expand the elementary school program. Meet with principals and school district managers to secure a commitment to implement a conservation education program. Order and deliver all needed materials to schools at no cost to a budgeted limit of \$2,000.
7. Institute procedures to notify customers of water waste. Use written notification at service address as a warning. Solicit voluntary compliance to water use restrictions. Develop procedures for placement of flow-restrictors and shut-off procedures for continued or excessive use.
8. Contact principal and maintenance manager at local high schools to develop specific guidelines for filling/topping off swimming pools and irrigation of fields/landscaping.

Stage IV (Supply from SFWD is 65 - 80% of normal based on snowpack measurements and runoff projects for next year.)

Goal: 25% mandatory rationing.

1. All Stage III plan elements are to be continued.
2. Augment and train staff to administer all aspects of the program and monitor results. Budget \$79,500.
3. Implement Plan instituting water rationing on a mandatory basis using the adopted Stage IV method. Under this program all previous voluntary use restrictions become mandatory. A Water Appeals Board will also be formed of community volunteers to consider appeals, if needed. The program is to contain rate changes (excess use charges) that penalize water use which exceeds allocation. Written notification to customers will be provided regarding the following allocation assignments:
 - a. Single-family residential customers are to be provided their 1990-91 rationing program allocations with a minimum of 12 units per two-month billing cycle to a maximum of 32 units per two month cycle from April through November, and 22 units per cycle from December through March. New single-family accounts will be assigned 75 gallons per capita per day (gpcd) for the first two occupants and 55 gpcd for each subsequent occupant. These accounts will be allowed to carry over (bank) any unused allocated water up to a cumulative limit of 10 units at the end of any billing period.

- a. Multi-family residential accounts are to be provided their 1990-91 rationing program allocations with a minimum of 12 units per account per two-month billing cycle. New multiple-family accounts will be assigned 55 gpcd. These accounts will be allowed to carry over any unused allocated water up to a cumulative limit of 10 units or 10% of their average billing period allocation, whichever is greater.
 - b. Commercial/governmental/industrial accounts are to be assigned 1991-92 allocations. New accounts of this type will be considered on an individual basis. Allocations will be assigned on the basis of conservation need.
 - c. Accounts for irrigation/outside use are to be allocated 40% of 1987 water use. New accounts will be assigned on the basis of conservation need, keeping within the restrictions that existing irrigation/outside accounts are allowed.
4. Appeals to the above allocation will be considered on the basis of increased permanent occupancy, individual medical need for more water, licensed day care residence, licensed residential medical care facility, or other documented special circumstance. Single-family residential appeals based on occupancy will be allocated 75 gpcd for the first two occupants and 55 gpcd for each subsequent occupant. Multi-family residential appeals based on occupancy will be allocated 55 gpcd. Consideration will also be given in circumstances such as large lots of 10,000 square feet or more with extraordinary water needs for landscape.
5. The Plan also contains additional mandatory non-essential water use restrictions:
 - a. Fill/top off swimming pool, spa, or other within allocation.
 - b. No new or expanded irrigation systems, except low water use systems.
 - c. Planting and replacing landscaping or water-dependent plant material is not recommended.
6. Use direct mailings, news media, and bill inserts to promulgate details of the rationing plan. A public meeting may also be needed/required to inform residents of program parameters. Budget \$15,000.
7. Require all residential, commercial, and other customers to install low-flow showerheads and water-saving toilet devices or water-saving toilets before granting an increase in allocated water. Increase distribution of showerheads and retrofit kits at no cost to the customer to a budget limit of \$11,000.
8. Accelerate the water audit program directed at the commercial sector. Offer free audits/advice on conservation. Distribute water-saving literature.
9. Enhance monitoring of water waste and adherence to Plan. Measures are to include:
 - a. Excess use charges.
 - b. Written violations.
 - c. Citations and/or fines.
 - d. Flow restrictors.
 - e. Water shut-off and re-connection fees.
10. Begin correlating data collection in anticipation of further supply reductions. Prepare data needed to implement Stage V rationing plan.
11. Review water rate structure and prepare to institute recommended changes to encourage further conservation through customer rate-paying.
12. Expand toilet rebate program for replacement of standard models with low-flow or ultra low-flow models to a budget limit of \$14,000. Use news media to publicize details of the program and to step-up customer response.

Stage V (Supply from SFWD is 50 - 65% of normal based on snowpack measurements and runoff projects for next year.)

Goal: 45% mandatory rationing.

1. All Stage IV plan elements are to be continued.
2. Stage V is to be implemented by City Council action after the Council has reviewed the Plan in consideration of the actual circumstances associated with the water shortage. New allocations, increasing water rationing reduction level, are to be assigned to all customers reflecting per capita allocations. Customers will receive written notification of their new allocations in as timely a manner as possible, as follows:
 - a. Single-family residential customers will be provided a health and safety allocation of 50 gallons per day for each permanent occupant of at least six months per year. No account will be allocated less than 100 gallons per day per household.
 - b. Multiple-family residential customers will be provided a health and safety allocation of 50 gallons per person per day. No account will be assigned less than 50 gallons per day times the total number of living units.
 - c. Commercial/governmental/industrial accounts are to be reduced to a total of 32% from 1991-92 allocations. New accounts of this type will be considered on an individual basis and reduced to the same level as existing accounts of the same type.
 - d. Accounts for irrigation/outside use are to be reduced by 90% of 1987 water use. New accounts of this type will be considered on an individual basis and reduced to the same level as existing accounts of the same type.
 - e. Residential accounts will be allowed to carry over unused allocated water as described in Stage IV plan. Existing water bank balances from previous supply shortage Stage V and is available for consumer use.
 - f. Appeals to assigned allocations will be considered as set forth in Stage IV. However, appeal consideration for large lots of 10,000 or more square feet with extraordinary landscape water needs may be suspended until supply increases.
3. Further non-essential mandatory water use restrictions are to include:
 - a. Washing automobiles, trucks, trailers, or other vehicles is prohibited except at commercial car washes.
 - b. No draining and filling of any swimming pool, spa, etc.
 - c. New service connections with expected significant consumption will be delayed until a Stage III drought condition exists.
 - d. No planting or replacing landscaping or water-dependent plant material.
 - e. Irrigation of public or private landscape areas such as parks, cemeteries, golf courses, etc., is permitted only with non-potable water.
 - f. Customers exceeding their allocation are subject to flow restriction or shut-off as specified in the Ordinance.
4. Use direct mailings, news media, and bill inserts to promulgate details of the rationing plan to a budget of \$13,000.
5. All water customers are to be encouraged to monitor their water use on a daily/weekly basis. Instructions are to be provided.
6. Further enhance public agency educational and informational presentations to a budget limit of \$18,000.
7. Inform media of all aspects of the conservation program. Frequently update on water supply situation. Include local, district, and State data which would be helpful in describing Millbrae's dependent relationship on San Francisco.

OTHER ITEMS

Priorities for Use

Priorities for use of available water are:

1. HEALTH AND SAFETY
 - Interior residential and fire fighting
2. COMMERCIAL/INDUSTRIAL/GOVERNMENTAL
 - Maintain jobs and economic base.
3. EXISTING LANDSCAPE IRRIGATION
 - Trees and shrubs.
4. EXISTING TURF AREAS IN PARKS, CEMETERIES, GOLF COURSES. ETC
5. SIGNIFICANT NEW DEMAND
 - New connections and new or replacement landscaping.

Water Allocated By Priority

(% Reduction)

<u>Stage</u>	<u>Residential</u>	<u>Commercial/Governmental</u>	<u>Irrigation</u>	<u>Total</u>
I	5%	5%	5%	5%
II	10%	5%	10%	9%
III	15%	5%	20%	13%
IV	19%	5%	60%	18%
V	45%	35%	90%	46%

City of Phoenix, Arizona
(Extracts from Drought Management Plan)

Stage 1: Water Alert: (would go into effect when either the Salt River Project or the Central Arizona Water Conservation District informs the City of an impending cutback in water deliveries.)

ESSENTIAL USES: Fire Fighting and medical uses-no restrictions. Hydrant flushing to a water truck.
WATER & WASTEWATER DPT.: Mandatory system conservation.

CITY DEPARTMENTS: Mandatory implementation of Drought Response Plans for 5% reduction in water use.

RESIDENTIAL: Voluntary reduction of use by compliance with schedule designated by the Water & Wastewater Department, plumbing retrofit and other reductions (behavior changes) generated through education and awareness.

COMMERCIAL: Voluntary reduction of use by compliance with designated irrigation schedule, retrofit, employee awareness and water use planning.

INDUSTRIAL: Voluntary reduction of use by compliance with designated irrigation schedule, retrofit, employee awareness and water use planning.

LANDSCAPE IRRIGATION/EXISTING INSTALLATION: Voluntary compliance to irrigate on schedule designated by the Water and Wastewater Department. Avoid all water waste.

LANDSCAPE IRRIGATION/NEW INSTALLATION: Voluntary installation of low water use plant materials and drip irrigation systems. Avoid all water waste.

GOLF COURSES: Voluntary compliance for private courses to irrigate at 50% of ET. Public golf courses, mandatory compliance to designated golf course irrigation schedule designated by the Water and Wastewater Department. Avoid all water waste.

SWIMMING POOLS: Voluntary compliance. Filling permitted for new and existing facilities.

Backwashing permitted onto landscaping or into sewer clean-out valve. Draining only permitted into water truck for useful disposal. Makeup permitted for existing facilities. Avoid all water waste.

AESTHETICS (FOUNTAINS, WATER FEATURES): Voluntary compliance to turn-off, drain and not refill existing features. No new fountains or features will be approved which are exterior to the site. Water features using treated wastewater or reuse water are exempt, however, they must be clearly posted. Avoid all water waste.

OTHER OUTDOOR USES: Allowing water to run-off into a street, alley, right of way, gutter or drain, or failure to repair a controllable leak is prohibited. These actions are defined as “waste”. Hoses should not be used to clean hard surfaced areas except to alleviate health or fire hazards. Hoses used for washing vehicles of any kind, or any other uses, must have positive shut off valves.

VEGETABLE GARDENS: Voluntarily limit irrigation to evening hours.

CONSTRUCTION: A water service connection for new construction shall be granted only if ULV water saving fixtures are installed and all landscaping is low water using. Water used for backfill and dust control should be limited.

PLANT NURSERIES: Commercial plant nurseries and similarly situated establishments are exempt from designated irrigation restrictions, but are expected to voluntarily curtail all non-essential water use.

FLOOD IRRIGATION: Water waste is prohibited. Voluntary compliance to a re-evaluation of the water requirement is encouraged. City staff will work with SRP to achieve reductions in water run and avoid water waste.

Stage 2: WATER WARNING: (programs will go into effect when the Salt River Project or the Central Arizona Water Conservation District reduces water deliveries to the City, or in the event of a catastrophic event of equal impact to the available water supply)

ESSENTIAL USES: Same as Stage 1: Water Alert

WATER & WASTEWATER DPT: Same as Stage 1: Water Alert plus maximize use of groundwater and other emergency supplies. Intensive public education programs, residential plumbing retrofit. A surcharge imposed on water rates. Expansion of leak detection and repair program and mandatory operational conservation.

CITY DEPARTMENTS: Stage 2 implementation of Department Drought Plan which results in mandatory 10% conservation savings.

RESIDENTIAL: Motivate voluntary reduction of use by 10%. Includes reductions achieved in voluntary outdoor water use restrictions, every third day watering and plumbing retrofit.

COMMERCIAL: Motivate voluntary reduction of use by 10%. Includes reduction achieved in voluntary outdoor water use restrictions, every third day watering, and plumbing retrofit. Restaurants required to serve water to customers only on request, display table tents or public notice.

INDUSTRIAL: Motivate voluntary reduction of use by 10%. Includes reduction achieved in voluntary outdoor water use restrictions, every third day watering and plumbing retrofit. Cooling blowdown water should be reused to the greatest extent possible.

LANDSCAPE IRRIGATION/EXISTING INSTALLATION: Same as Stage 1: Water Alert

LANDSCAPE IRRIGATION/NEW INSTALLATION: Same as Stage 1: Water Alert

GOLF COURSES: Same as Stage 1: Water Alert

SWIMMING POOLS: Same as Stage 1: Water Alert

AESTHETICS (FOUNTAINS, WATER FEATURES): Mandatory turn off and no refill to existing fountains or features which are exterior to the site.

OTHER OUTDOOR USES: Waste prohibited. Washing of hard surfaces prohibited except washing to alleviate health or fire hazards. Washing personal and commercial vehicles limited to assigned irrigation day with hand-held hose with a positive shut off valve, bucket or commercial washers.

VEGETABLE GARDENS: Same as Stage 1: Water Alert

CONSTRUCTION: Same as Stage 1: Water Alert

PLANT NURSERIES: Same as Stage 1: Water Alert

FLOOD IRRIGATION: Same as Stage 1: Water Alert

Stage 3: WATER EMERGENCY (programs will be implemented when SRP or CAWCD informs the city that additional reductions in deliveries will occur to a level such that intra-service area water transfers, city wells and feasible water supply augmentation measures will be inadequate to meet water demands. A 30% drought surcharge on water rates will be implemented to meet the increased regulatory and enforcement expenses.

ESSENTIAL USES: Same as Stage 1: Water Alert

WATER & WASTEWATER DPT: Same as Stage 2: Water Warning Implementation, plus increased surcharge to meet escalated drought expenses and to motivate increased conservation. Avoid all water waste.

CITY DEPARTMENTS: Mandatory 10% decrease in water consumption. Avoid all water waste.

RESIDENTIAL: Mandatory restriction of lawn and garden watering to between the hours of 8 pm and 6 am, every third day. Mandatory retrofit of all plumbing fixtures and voluntary changes in water use behavior. Avoid water waste.

COMMERCIAL: Mandatory restriction of outdoor water use, as in residential. Mandatory retrofit of all plumbing fixtures and voluntary changes in water use behavior. Mandatory re-evaluation of all water use processes to gain maximum resource efficiency. Continue employee awareness. Avoid water waste. Restaurants are restricted from serving water to tables, except upon requests from diners.

INDUSTRIAL: Mandatory restrictions of outdoor water use, as in residential and commercial. Mandatory retrofit of all plumbing fixtures and voluntary changes in water use behavior. Mandatory re-evaluation of all water use processes to gain maximum resource efficiency. Continue employee awareness and avoid water waste.

LANDSCAPE IRRIGATION/EXISTING INSTALLATION: Mandatory restriction of lawn watering, appropriate hours and frequency of watering would be established by the Water and Wastewater Department.

LANDSCAPE IRRIGATION/NEW INSTALLATION: Installation of any new landscape would be prohibited, except by permit, unless treated wastewater or nonpotable water is applied and such use is posted.

SWIMMING POOLS: Filling of any new or existing pool would be prohibited. Addition to make-up water would be prohibited. Draining would be made to landscaping, to the sewer clean-out valve or a water truck for useful disposal.

AESTHETICS (FOUNTAINS, WATER FEATURES): Draining and refilling water features, regardless of water source or location would be prohibited, except by permit, and except those using treated wastewater or nonpotable water and such use is posted. (Permitted features would be regulatory holding areas principally used for large turf irrigation.)

OTHER OUTDOOR USES: Same as Stage 2: Water Warning: Personal and Commercial vehicles would only be washed at a commercial facility. All water waste would be avoided.

VEGETABLE GARDENS: Same as Stage 2: Water Warning.

CONSTRUCTION: A water service connection for new construction would be approved only if ultra-low flow fixtures and appliances are used for indoor plumbing. And if landscaping has a secondary water supply, such as reuse. Construction water for consolidation of backfill, dust control or non-essential uses would be reviewed by the Water and Wastewater Department on an individual basis.

PLANT NURSERIES: Same as Stage 2: Water Warning.

FLOOD IRRIGATION: Same as Stage 2: Water Warning.

Stage 4: WATER CRISIS: (programs will be implemented when Stage 3 emergency supply and conservation programs are insufficient to meet water demand. Water price rationing, drought surcharge, will be adjusted to reduce demand to match available supplies.

ALL USES: Same as Stage 3: Water Emergency plus additional measures, including increased price rationing and any other measures as may be determined necessary by the Water and Wastewater Director to protect human health and safety.

Seattle, Washington
(Extracts from Water Shortage Contingency Plan)

Advisory Stage:(Total reservoir storage is not projected to be at standard operating capacity as of June 1, due to exceptionally low snow pack, precipitation and/or lack of carryover storage from previous year. Total reservoir storage and predicted inflows are significantly below historic “normals” for the current time of the year, and supply modeling indicates that expected demands may not be met if this trend continues or worsens.)

Objectives:

- * To prepare the department, city, relevant agencies and water users for potential water shortage, thereby allowing all parties adequate planning and coordination time.
- * To undertake supply management actions that forestall or minimize the need later for more stringent demand or supply actions.

Public Message:

“Potential exists for lower than normal supply; conditions may return to normal or, later on, we may need to reduce consumption. We’ll keep you informed.”

Communications Actions:

- Brief elected officials.
- Appoint Shortage Management Team to meet as often as appropriate to evaluate conditions, determine actions and make assignments.
- Intensify ongoing media education effort about the water system, particularly relationship of weather patterns to supply and demand; provide up-to-date data and implications for water use, if known.
- Initiate report to purveyors requesting that they trigger their response plans.
- Establish Advisory Committee consisting of major customer groups, e.g., parks departments, landscape industry, etc., to assist Shortage Management Team define message and provide feedback on utility actions.
- Initiate status report to entities with special interests, e.g., large water users especially landscape and nursery industry, parks, major water using industries.
- Prepare and distribute public information materials explaining the Water Shortage Contingency Plan stages and ranges of actions; prepare “Questions and Answers” for people planning new landscaping.
- Intensify coordination with other regional water suppliers to learn what conditions they are projecting for their systems.
- Intensify communication and coordination with Seattle City Light, state and federal response agencies and Tribes about water supply conditions and projections.
- Evaluate ability, resources, plans to move into Voluntary Stage; as appropriate, begin preparatory measures.

Seattle Water Internal Operating Actions

- Intensify data collection actions (stream flows, snow pack conditions) and monitoring weather forecasts.
- Intensify Seattle Water Department’s (SWD) computer modeling runs of projected supply, storage and demand scenarios.
- Intensify supply side management techniques to optimize existing sources.

- Assess current water main flushing and reservoir cleaning activities to determine whether they should be accelerated to be completed prior to the peak season or reduced to conserve supply; communicate strategy to purveyors.
- Assess water quality in reservoirs and distribution system to target for correction areas that may be predicted to experience severe degradation with reduced consumption.
- Initiate planning and preparation for Voluntary Stage actions.

Voluntary Stage:(Supply conditions identified in the Advisory Stage have not improved. Demand levels indicate that a more systemic response to managing the situation is called for.)

Objectives:

- To maintain or reduce demand to meet target consumption levels by customer voluntary actions.
- To forestall or minimize need later for more stringent demand or supply management actions.
- To minimize the disruption to customers' lives and businesses while meeting target consumption goals.
- To maintain the highest water quality standards throughout the shortage.

Public Message:

"We are relying on support and cooperation of all water users to stretch the available water supply. Demand needs to be reduced by ____%. Customers are responsible for determining how they will meet this goal. Water waste is not allowed. If everyone cooperates, we will avoid imposing more stringent restrictions. In addition to meeting essential water needs of customers, meeting the needs of fish habitat and other environmental concerns is a priority."

Voluntary Stage Actions

The Shortage Management Team will meet frequently to re-evaluate the situation based on current and projected supply conditions and the season, and determine the appropriate actions and strategies. The Team will determine target consumption goals to be achieved on a voluntary basis which may be revised as necessary.

Based on the consumption goal, some or all of the following actions will be taken; those actions that are asterisked (**) will be considered initially for implementation if demand reductions more than 10 to 15 percent below normal are necessitated, or later if voluntary measures implemented fail to deliver targeted savings.

Communication Actions:

- Establish systematic communications with elected officials; Superintendent and Shortage Management Team communicates the nature and scope of voluntary measures and strategy to Mayor and Council, purveyors, Tribes and resource agencies.
- Shortage Management Team evaluates whether targeted consumption levels and supply conditions warrant a rate surcharge to reinforce voluntary actions and/or to recover revenue losses.(**)
- Prepare appropriate legislation regarding emergency surcharges, if required.
- Meet with the Advisory Committee to, throughout the shortage, help develop public information messages and materials and to obtain feedback on utility actions.
- Initiate major public information, media and advertising campaign:
 - In daily newspapers, publish and promote consumption graph that displays the goal and previous 24 hour consumption;

- Promote consumption goals for typical households and a percentage reduction goal for commercial customers:
- Develop and implement marketing plan, including paid advertising that: serves to keep customers informed about supply and demand conditions; reinforces desired customer actions; recommends customer actions to reduce demand sufficiently; and, depending on conditions, reminds customers that if goals are not achieved, restrictions may be necessary;
- Identify what potential next steps will be to reduce demand including timing, what type of restrictions and/or surcharges will be imposed;
- Establish routine timing for press releases (e.g., every Monday morning) that provides current status and outlook; present information in standardized format that becomes familiar to media and public;
- Include water quality information in public information so that if flushing is necessary, the public understands that it is essential for water quality maintenance.
- Meet with landscape industry representatives to inform them of current and projected conditions; develop partnership programs and informational materials on the shortage, consumption goals, etc. for distribution by industry and utilities.
- Continue and intensify coordination and communication with state and federal resource agencies and Tribes about supply conditions, demand management actions and stream flow levels.
- Identify and promote reduced evapotranspiration (ET) rate for large irrigators.
- In collaboration with Health Department officials, develop information materials for customers on gray water use.
- Establish and promote “hot lines” for customers to obtain additional conservation information.
- Contact largest customers to request percentage reduction. Contact city and other public agencies to inform them of conditions and request their cooperation.
- Prepare list of commercial car wash facilities that recycle water.
- Establish regular communication mechanism to keep Water Department employees, especially customer service representatives and water service consultants, up to date on goals, conditions, and actions.
- Print generic postcards to acknowledge receipt of customer correspondence regarding shortage and to inform customer that specific response is being prepared.
- Initiate remaining planning and preparation for Mandatory Stage.

Seattle Water Internal Operating Actions

- Continue actions listed in the Advisory Stage.
- Eliminate all operating system water uses determined not to be essential to maintain water quality such as pipeline flushing, reservoir overflows; complete cleaning of any in-town reservoirs known to be vulnerable to warm weather taste and odor concerns.
- Increase water quality monitoring actions.
- Communicate flushing policy to purveyors; eliminate demand metering charges.(**)

Supply and Demand Management Actions:

- Request the Corps of Engineers to reduce flow requirements and modify use of the Chittenden Locks. (**)
- Issue a request that nonrecirculating fountains be turned off. (**)
- Restrict hydrant permits to essential purposes. (**)
- Activate any existing interties to increase supply availability. (**)
- Request that Fire Department limit training exercises that use water.

- Request that city and county agencies eliminate washing fleet vehicles unless recycling car washes are used.
- Request that hosing sidewalks, driveways, parking lots, etc. be limited to situations that require it for public health and safety.
- Have SWD field personnel “tag” observed obvious water waste such as hoses without shutoff nozzles, gutter flooding, etc. with notice that informs customer about the supply conditions and need to conserve.
- Evaluate ability to accelerate or enhance or expand long term conservation programs; implement as appropriate.
- Request that purveyors who have alternative sources utilize them. (**)
- Ready the pump plants on Chester Morse Lake. (**)
- In cooperation with state and federal resource agencies and Tribes, review stream flow levels.

Mandatory Stage:(Progression to this stage is made if it is determined that measures undertaken in the Voluntary Stage are not adequately reducing demand to the targeted level and, that progressing to mandatory restrictions is necessary to forestall the potential for a serious water shortage.)

Objectives:

- To restrict certain defined water uses in order to reduce demand to target consumption goals that have not been met through customer voluntary action;
- To ensure that throughout the remaining projected duration of the drought an adequate water supply exists to protect public health and safety and to balance the need for stream flows for fish habitat;
- To minimize the disruption to customers’ lives and businesses while meeting target consumption goals;
- To maintain the highest water quality standards throughout the shortage.

Public Message

“It is necessary to impose mandatory restrictions to reduce demand because the voluntary approach is not resulting in the necessary savings. We are continuing to rely on the support and cooperation of the public to comply with these restrictions but need the certainty and predictability of restricting certain water uses in order to ensure that throughout the duration of this shortage an adequate supply of water is maintained for public health and safety and fish habitat.”

Actions in the Mandatory Stage

Communication Actions:

- The Shortage Management Team recommends nature, scope and timing of restrictions to the Superintendent. Director of Water Quality determines that water supply and demand management strategies will not result in unacceptable water quality degradation.
- Superintendent recommends to Mayor and Council moving to Mandatory Stage and other appropriate actions;
- Council adopts legislation on mandatory restrictions and, if needed and not already in place, emergency surcharges;
- Through a press conference, paid advertising and other means to inform the public including direct mail, announce the scope and nature of mandatory restrictions, the enforcement mechanism, rate surcharges, target consumption goals, projections for how long restrictions will be in place and the reasons for imposing restrictions. Clearly identify whether and what kind of additional restrictions may be imposed if goals for reduced consumption are not achieved;

- Clearly identify and explain any exemption from restrictions;
- In communicating mandatory restrictions to public, clearly distinguish between lawn/turf watering and watering gardens and ornamentals;
- Set up and promote “Customer Hotline” to report violations of restrictions;
- Urge customers who irrigate with private wells, that if they choose to use them to install signs to let public know that it is well water being used;
- Continue and enhance communication actions from Advisory and Voluntary Stages;
- Evaluate ability, resources, plans to move into Rationing Stage; as appropriate, begin preparatory measures.

Seattle Water Internal Operating Actions

- Continue actions from previous stages as appropriate;
- Finalize and implement procedures for exemptions from restrictions and/or emergency surcharges;
- Finalize and implement enforcement procedures for restrictions including highly visible “Water Watchers”;
- Increase water quality monitoring actions at storage and in-town reservoirs.

Supply and Demand Management Actions

Overall supply conditions will be considered by the Shortage Management Team in evaluating which restrictions to impose. If the supply conditions continue to deteriorate, before moving to the Rationing Stage, the Drought Management Team will ban lawn watering. Lawns planted within 60 days PRIOR to mandatory restrictions being imposed will be allowed to water for no more than 60 days from the time of planting; some or all of the other exemptions pertaining to outdoor water use may be retained.

Restrictions:

- Prohibit all irrigation - turf, lawn and garden watering - between 10:00 a.m. and 7:00 p.m.
- Limit all lawn or turf watering to two days or one day a week, depending on target consumption goal. If demand has already been reduced by 15% through other measures, limited turf watering during July and August to two days a week on a region-wide basis will further reduce average daily demand by approximately 15 million gallons; limiting lawn or turf watering to one day a week will yield an additional average daily reduction of 15 to 20 million gallons.
- Prohibit use of any ornamental fountain using drinking water for operation or make-up.
- Prohibit car washing except at commercial car wash facilities that recycle water.
- Rescind hydrant permits.
- Prohibit washing of sidewalks, streets, decks or driveways except as necessary for public health and safety.
- Limit pressure washing buildings to situations that require it as part of scheduled building rehabilitation project (e.g., painting).
- Prohibit water waste including untended hoses without shut off nozzles, obvious leaks and water running to waste, such as gutter flooding and sprinkler/irrigation whose spray pattern unnecessarily hits paved areas.

Exemptions

- Water may be used at the minimum rate necessary to establish and maintain turf areas newly planted within 60 days prior to mandatory restrictions being imposed provided that:
--the property owner/manager or other responsible party complies with the administrative procedures to obtain the exemption;

- the property owner/manager complies with other restrictions, especially regarding water running to waste.

For the purposes of this exemption, over seeding turf does not constitute a newly planted area.

- For purpose of dust control, water may be applied to construction areas or other areas needing to comply with air quality requirements. If reclaimed water is available, require that it be used for dust control.
- Ballfields and play fields may be watered at the minimum rate necessary for dust control and safety purposes.
- Automated irrigation systems may be used at the minimum rate necessary to maintain survival of: residential and commercial lawns; golf greens and trees; high priority public use areas in public parks and Seattle Center, provided:
 - that the area has been audited by a certified Irrigation Auditor and that the area can be demonstrated to be irrigated according to an ET based irrigation schedule; and
 - that the property owner/manager complies with other restrictions, especially regarding water running to waste; and
 - the property owner/manager or other responsible party complies with the administrative procedures to obtain the exemption.
- The utility will exempt customers with special medical needs such as home dialysis from any emergency surcharge provided individual customers notify the utility of such a need.

Water Supply

- Emergency pumping of Chester Morse Lake will commence when storage reaches the rim of the natural lake.
- Continue intensive supply side management measures including possible changes in instream flow releases in consultation and cooperation with the Corps of Engineers, Tribes, and state and federal resource agencies.
- If not already implemented, activate interties and other alternative sources of supply.

Rationing Stage: (Recognition that a critical water situation exists. Without significant curtailment actions, a shortage of water for public health and safety will be imminent.)

Actions in the Rationing Stage

Based on supply conditions, the Shortage Management Team will establish a per capita allotment for the residential sector and a percentage reduction goal for the commercial sector. Penalties for exceeding water allocations will be established as excess use charges. Commercial, multi-family and industrial users will be asked to reduce water use by a set percentage of the average of the twelve months prior to the current shortage. Emergency rate surcharges will be established to provide an additional incentive to reduce water use.

Communication Action

- Continue all previous, applicable actions.
- Define the problem to the public as an emergency and institute formal procedures to declare a city emergency.

- Inform customers of the water use allocation; the allocation will be a set amount of water per household per month assuming three people per household; inform customers of the procedure on how to change allocation for their account if more than three people reside in the home.
- Coordinate with police and fire departments requesting their assistance in enforcing prohibition of water waste.
- Inform customers that taste and odor water quality problems may occur with system-wide reduced water consumption.
- Inform customers about possible pressure reductions and problems this may entail.
- Define and communicate exemptions for medical facilities and other public health situations.

Seattle Water Operating Actions

- Continue and enhance “Water Watcher” patrols.
- Continue actions listed in prior stages.
- Curtail fire line testing unless it can be shown to be essential to protect the immediate public health and safety.
- Further enhance water quality monitoring actions.

Supply and Demand Management Actions

- Work with Army Corps of Engineers to substantially limit lockages at Hiram Chittenden Locks.
- All lawn and turf irrigation is prohibited. Customers may irrigate the remainder of their landscape if they choose to use their allocations for those purposes.
- Make reclaimed water available to tanker trucks for street cleaning, construction projects, landscape irrigation, dust control, etc.
- Require that all fire fighting agencies discontinue the use of water in training exercises until emergency is over.
- Rescind all hydrant permits.
- Require local parks departments to close down pools.

Santa Barbara, California
(Extracts from Water Shortage Contingency Plan)

Stage 1: Drought Watch (Water supply for the current or impending water year is approximately 10% less than projected demand)

Strategies:

- Council adopts resolution declaring a Drought Watch.
- Staff publicizes declaration of Drought Watch and provides media and public with information regarding status of water supply system.
- Staff directed to make an immediate 10% reduction in water use at city facilities:
- Public education efforts shift toward encouraging temporary and voluntary lifestyle changes to reduce water consumption, with a goal of 10% reduction. List of suggested practices is made available to customers through water bill inserts and other public information sources.
- Customers urged more strongly to incorporate efficiency improvements. Encourage neighborhood watch regarding excessive use of water.
- Schedule for taking the city's Cachuma Lake allocations is reviewed. Staff considers recommendation to reduce allocations for all Cachuma users.
- Staff publicizes results of conservation efforts and progress toward goal of matching supply to demand.

Enforcement:

- Voluntary conservation encouraged more intensively.
- Complaints regarding water waste are referred to staff for follow-up letter or phone call. "Notice of Water Waste" posted by city staff upon verification of misuse and shut off provisions vigorously enforced upon verification of flagrant violation by city staff.

Stage 2: Drought Alert (Water supply for the current or impending water year is approximately 15% less than projected demand.)

Strategies:

- Council adopts resolution declaring Drought Alert and activating reduced drought allotments under the block rate billing structure.
- Staff publicizes declaration of Drought Alert and provides the public and media with updated information on status of water supply system.
- Staff directed to make an immediate 15% reduction in water use at city facilities:
 - Landscape irrigation reduced.
 - Leak detection and repair program augmented.
 - Ornamental fountains turned off.
 - Reduced cleaning of city vehicles and facilities.
 - Reduced flushing of streets, sewers, and storm drains.
 - Public Works Director restricts use of fire hydrants.
- Public education program emphasizes the severity of the water shortage. Customers asked for 15%-25% voluntary reduction in usage and advised that the first level of reduced drought allotments under the block rate billing structure has gone into effect.
- Telephone "hot line" established to report violations of water use restrictions.

- The following potable water use regulations are activated in addition to on-going water waste restrictions.
- Hosing of paved surfaces prohibited, except as necessary for health and safety.
 - Restaurants required to post notice of Drought Conditions and to serve water upon request only.
 - Operation of ornamental fountains prohibited.
 - Landscape irrigation prohibited between 8:00 a.m. and 6:00 p.m.
 - Vehicle washing restrictions to use hand held bucket and quick rinses using hose with positive shut-off nozzle, or commercial car wash.
 - Hotels/motels required to post notice of Drought Conditions urging guests to conserve water
- Water supply system pressures lowered, where feasible, to reduce water use.
- Inventory of emergency supply options prepared and evaluated by staff.
- Assess potential for shifting customers to reclaimed water system for duration of drought.
- City staff prepares recommendation to Council regarding supplemental funding for drought response services and the need to increase block rate charges to motivate further conservation and to provide additional revenue.
- Staff publicizes results of conservation efforts and progress toward goal of matching supply to demand.

Enforcement

- Block rate structure and reduced drought allotments used to provide price incentives to reduce water use.
- Drought Enforcement Officer, and if necessary, additional staff hired on temporary basis to:
 - Patrol city services area
 - Respond to complaints about misuse of water.
 - Advise customers of reduced drought allotments and provide conservation materials.
 - Implement procedures for issuance of citations for waste or misuse of water pursuant to Santa Barbara Municipal Code.
- Citation penalties as follows:
 - Fines of \$25.00 for first and \$50.00 for second violation.
 - Installation of flow restrictor or shut off of service for third violation or for flagrant violation.

Stage 3: Drought Emergency (Supply for current or impending water year is 20%, or more, below projected demand; or that the ordinary demands and requirements of water customers cannot be satisfied without depleting the water supply to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.)

Strategies:

- Pursuant to the provisions of California Water Code, Chapter 3, the Council adopts resolution declaring a Drought Emergency and further reducing drought allotments.
- Staff announces declaration of Drought Emergency and provides the public and media with updated information on water supply status.
- City facilities directed to make an immediate 20% reduction in water use:
 - Emergency funding recommended for leak repair.
 - Washing of city vehicles and facilities eliminated except as necessary for health, safety, and sanitation requirements.
 - Filling/topping of city pools is discontinued.

- Flushing of streets, sewers, and storm drains done on emergency basis only.
- Use of fire hydrants restricted to fire suppression activities only.
- Landscape irrigation at city facilities is discontinued, except where reclaimed water is used.
- Public education program explains the critical nature of the water shortage, announces a further reduction in drought allotments, and warns that penalties for violation of water use restrictions have been made more severe.
- The following potable water use regulations are activated in addition to on-going water waste restrictions. Exceptions may be cases involving health and safety. Decisions of staff are appealable to a staff/Water Commission committee which shall include representatives from the Parks Department and Public Works Department.
 - Hosing of paved surfaces prohibited.
 - Restaurants required to serve water upon request only.
 - Operation of ornamental fountains prohibited.
 - Landscape irrigation prohibited.
 - Washing of vehicles prohibited except as necessary for health, safety, and sanitation.
 - Filling/topping of pools and spas prohibited.
 - Hotels/motels required to post notice of Drought Condition urging guests to conserve water.
- Emergency supply augmentation options exercised.
- Meters served under irrigation rates are shut off.
- Staff publicizes results of conservation efforts and progress toward goal of matching supply to demand, utilizing water production and wastewater data.
- Further emergency recommendations made to Council upon a determination by the city Administrator that efforts to date are insufficient to balance supply and demand.

Enforcement:

- Block rate structure and further reductions in drought allotments under block rate billing structure used to provide incentive to conserve water. Possible increase of block rates to punitive levels in addition to reduced allotments.
- Additional Drought Enforcement Officer and, if necessary, additional staff hired to provide increased public visibility and more stringent enforcement.
- Citation penalties are as follows:
 - Fines of up to \$250.00 for each violation of water use restrictions.
 - Installation of flow restrictor or shut off of service for second violation or for flagrant violations.